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No. XIV. OF VOL. II., 1932. LONDON, SATURDAY, OCTOBER 1, 1932 Pp. 128 — Price 1s.
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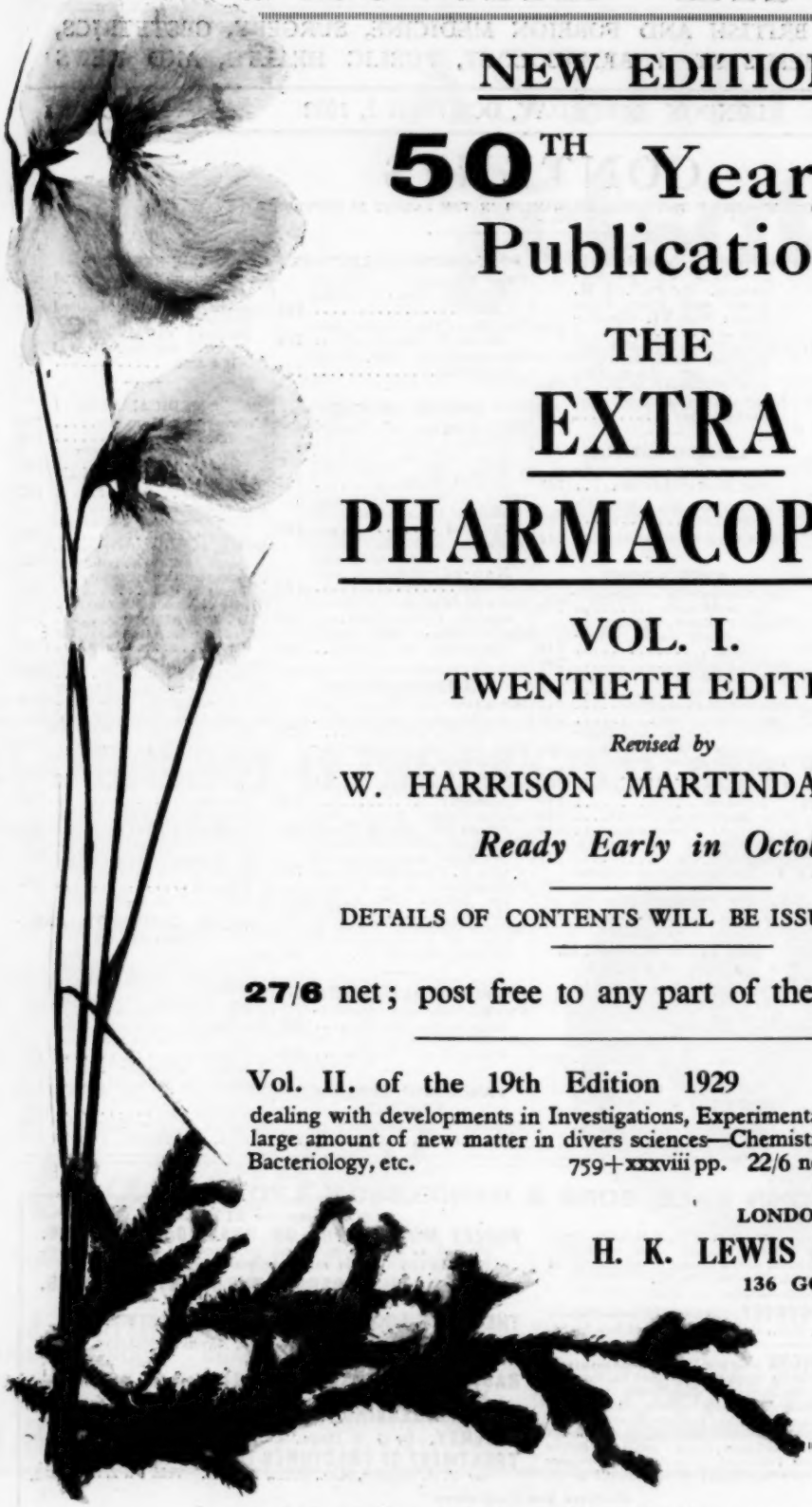

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ADDRESSES AND ORIGINAL ARTICLES

A LOCAL OUTBREAK OF DEVONSHIRE COLIC

BY M. C. N. JACKSON, M.B. LOND.

AND

L. N. JACKSON, *M.C.*, D.M. OXF.

ALTHOUGH Devonshire colic was probably an endemic disease long before that time, its cause was not determined until the latter part of the eighteenth century. G. Musgrave,[1] in 1703, stated that the colic which occurred in Devonshire and which was sometimes associated with paralysis was due to the excessive consumption of crude cider which was too acid. J. Huxham,[2] who in 1752 graphically described the colicky pains and paralysis, took the view that the disease was caused by the tartar extracted from the apples in the process of cider brewing. It was not until 1767 that Sir George Baker, an alert-minded Devonian, finally recognised that lead colic and Devonshire colic were one and the same disease. He demonstrated [3] that Devonshire cider contained lead, whereas Herefordshire cider did not, and further drew attention to the fact that in Devonshire the cider presses and storage tanks were very commonly lead-lined. His exposure of this practice, and that of "correcting" sour cider by the addition of metallic lead, litharge, or lead acetate, produced a storm of criticism, and he was denounced as a traitor to his county.

Lead has long ceased to play any part in the manufacture or storage of cider, nevertheless minor outbreaks of plumbism among cider-drinkers occur from time to time. The following is an account of such an outbreak recently noted among habitual cider-drinkers in a country district near Exeter. When the connexion between plumbism and cider-drinking first became evident to us, the public-houses frequented by our patients were investigated. It was found that certain of the publicans were in the habit of drawing their cider from the cask to the engine through lead pipes. Subsequent analysis of samples of cider (*a*) from cask and (*b*) from engine proved that lead contamination occurred in the conducting pipes and not, as in Baker's cases, during the process of manufacture or storage. In passing, it is interesting to note the relative insusceptibility of most persons to this form of lead poisoning as indicated by the comparatively few cases that have come to us complaining of symptoms, despite the fact that much of the cider drunk in this district must have been thus contaminated for many years.

Clinical Notes

All our cases occurred in males. Other sources of lead intake were, as far as possible, excluded. The cases fall into two groups: 1. Those complaining of symptoms referable to lead poisoning. 2. Symptomless cases investigated because they were known to be habitual cider-drinkers frequenting the same public-houses as those in group 1.

The clinical examinations of these cases were made in the autumn of 1931.

[1] De arthritide symptomica, Oxoniæ, 1703.

[2] Opusculum de Morbo Colico Damnoniensi. Lond., J. Hinton, 1752.

[3] Med. Trans. Lond., 1772, i., 175.

1. CASES WITH SYMPTOMS

CASE 1.—A. B., aged 59, an army pensioner, has had repeated attacks of intestinal colic and constipation since 1922. In 1926 pallor and loss of power in both forearms were noted. In 1928 a stippled blue line appeared on the gums. The weakness and wasting of forearms and hands have increased since then. He had malaria and typhoid in 1898 and acute urethritis in 1900, followed by urethral strictures and several attacks of gonococcal arthritis. There is no history of headaches or fits. He has been a cider-drinker for 20 years, and admits to a maximum of five pints daily. Since the war he has been obtaining his cider from houses A, B, and C. He was a large pale man with bilateral wrist-drop, and a stippled blue line on the gums round his few remaining teeth. Blood pressure 165/100. There were no other relevant physical signs.

Laboratory findings.—Blood: red cells 3,300,000 per c.mm., hæmoglobin 48 per cent., punctate basophilia present. Urine: albumin and pus present, lead present. Wassermann reaction negative.

CASE 2.—C. D., aged 60, a foreman labourer employed by the district council. Complained of attacks of giddiness in 1923, and nystagmus was noted at that time. This symptom and sign were again noted in 1928. In November, 1929, he began to have attacks of severe intestinal colic with vomiting and constipation. At this time weakness of wrists was complained of and a blue line noted. In February, 1930, when pulling on a rope, he noticed sudden marked increase of weakness in his hands and wrists. He also noticed for the first time some weakness of his legs. There is no history of headaches or fits. Although he only admits to a maximum of three pints daily he is known to have been a heavy cider-drinker for at least ten years, and to have frequented all the public-houses in the town during this time. His friends state that he has often obtained a free drink by offering to consume the first glass of cider drawn from the engine in the morning. In June, 1930, he was admitted to the Royal Devon and Exeter Hospital under the care of Dr. Charles Seward, where he was found to have diabetes mellitus. There was wasting of both hands, especially the thenar muscles, and loss of power in the extensors of both wrists. Albuminuria and punctate basophilia were found. In July, 1931, he was admitted to the London Hospital under the care of Dr. Donald Hunter. The diagnosis of diabetes mellitus was confirmed. Blood pressure 135/85. There was gross wasting of both forearms, weakness and wasting of extensors of wrists and small muscles of hands, and of both legs below the knees, especially of dorsi-flexors. There was also analgesia to pinprick, heat, and cold over the segmental areas C.4 to D.2 on both sides.

Laboratory findings.—Blood: red cells 4,000,000 per c.mm., hæmoglobin 64 per cent., punctate basophilia present. Urine: sugar and albumin present, lead not found. Wassermann reaction negative. Fæces: lead present.

In the opinion of Dr. Donald Hunter and Dr. George Riddoch the paralysis of the upper limbs and the areas of analgesia were due to a hæmatomyelia incurred at the time of the accident while felling trees. The foot-drop was evidently due to lead palsy, and it improved following two long courses of ammonium chloride, together with a low calcium diet.

CASE 3.—E. F., aged 50, a general labourer, was referred for dental treatment in 1928, at which time a stippled blue line on the gums was noted. In September, 1929, he complained of morning retching, central abdominal pain, and loss of weight. In January, 1930, he complained of abdominal pain and constipation, and was pale, wasted, and tremulous. In April, 1931, he had a return of abdominal symptoms, and was admitted to the Royal Devon and Exeter Hospital under the care of Dr. C. J. Fuller. He had typhoid in 1915, but had always been otherwise healthy. There is no history of headaches or fits. He began to drink cider in 1921, having previously been a beer-drinker. He admits to an average consumption of five pints daily, rising occasionally to ten pints daily. He obtains his cider from houses A, B, D, E, F, and G. He has, acting on advice, given up cider since his discharge from hospital, and has much improved. He was a healthy-looking, edentulous man, with a dull mentality. Blood pressure 140/95. There was slight wasting of the small muscles of both hands but no noticeable weakness and a fine tremor of the tongue and hands.

Laboratory findings.—Blood: punctate basophilia present. Urine: lead present, no albumin found.

CASE 4.—G. H., aged 70, a farm labourer, had attacks of giddiness and an irregular pulse in 1921. In 1922 he had dyspnœa, tachycardia, and a fainting attack. In 1925 dyspnœa and tachycardia were again noted. In July, 1930, he had an attack of acute intestinal obstruction; was admitted to hospital, where a laparotomy was performed. Nothing was found to account for his symptoms, and he made an uneventful recovery. In October, 1930, he had an attack of colicky abdominal pain, and constipation relieved by enemata. A month later he had another similar attack. In January, 1931, he had a further attack, and a stippled blue line noticed on the gums. He was warned off cider, and has been free from symptoms since. There is no history of headaches or fits. He has been a moderate cider-drinker all his life, and admits to one pint daily, obtained from either house C or house D. He was a fairly healthy-looking old man, with a slightly tremulous, furred tongue. A stippled blue line was present on the gums. Blood pressure 130/90. There was a fine tremor of hands and some wasting of both thenar eminences. He has noticed slight weakness of both wrists, the left more so than the right. He is a left-handed man.

Laboratory findings.—Blood: very occasional red cells showing punctate basophilia. Urine: small amount of lead present, no albumin.

CASE 5.—I. J., aged 48, a labourer, had an attack of colicky abdominal pain and constipation in 1922. He had further similar attacks in 1923, 1929, and 1930. A stippled blue line on the gums was noted in 1929. There is no history of headaches or fits. He has drunk cider for the last ten years and admits to three or four pints daily, which he obtains from houses A, C, D, E, F, and G. He used to have the first drink at 11 A.M., but latterly has studiously avoided doing so. He was a healthy-looking man with a slightly furred tongue. A stippled blue line on the gums was present. Blood pressure 140/85. No other abnormality found.

Laboratory findings.—Blood: punctate basophilia present. Urine: lead present, no albumin.

CASE 6.—K. L., aged 33, a labourer, has had several attacks of colicky abdominal pain and constipation since February, 1931. There is no history of headaches or fits nor of any other illness. He has been a cider-drinker all his life, and admits to two or three pints daily which he obtains from houses E, F, and G. He never drinks cider before 6 P.M. Nothing abnormal was found except a stippled blue line on the gums. Blood pressure 140/90.

Laboratory findings.—Blood: punctate basophilia present. Urine: lead present in small amount, no albumin.

CASE 7.—M. N., aged 36, a labourer latterly employed as cleaner at house C, had two attacks of colicky abdominal pain, vomiting, and constipation, each lasting for about a week in January and February, 1931. In May, 1931, he had a third attack which was more severe and lasted a fortnight. There is no history of headaches or fits. In 1918 he was invalided out of the Army with "stomach trouble." He has drunk cider regularly since 1918. He admits to three pints daily, and frequents all the houses in the town. He used to have the first drink in the morning till warned against it in 1931. He was a somewhat pale, under-sized man. Nothing else abnormal was found except a stippled blue line on the gums. Blood pressure 130/85.

Laboratory findings.—Blood: films unsatisfactory. Urine: lead present, no albumin.

CASE 8.—O. P., aged 41, a sawyer, had several attacks of colicky abdominal pain, constipation, and vomiting in 1930. In May, 1931, he had a fit which came on suddenly without warning; he was seen to throw his head up, spin round, and fall. When seen immediately afterwards by one of us (L. N. J.) he was pale, twitching, and foaming at the mouth. He had bitten his tongue, was vomiting repeatedly, and complaining of intense headache. An hour later he had recovered almost completely. There was no previous history of headaches or fits or of any other illness. He has been a cider-drinker all his life, and admits to five or six pints daily, which he obtains from houses B, C, E, G, H, and I. He habitually has a drink at 11 A.M., and often has the first drink drawn.

On examination after recovery from the fit he had a good colour. There was a stippled blue line present on the gums and a fine tremor of the tongue and hands. Blood pressure 140/90. No other abnormality found.

Laboratory findings.—Blood: punctate basophilia present. Urine: lead present in considerable amount, no albumin.

The remaining two cases in this group do not belong to this town, but come from a village some ten miles distant. They were admitted to the Royal Devon and Exeter Hospital under the care of Dr. Frank Roper and Dr. Charles Seward respectively.

CASE 9.—Q. R., aged 56, a platelayer, has had repeated attacks of colicky abdominal pain and constipation since 1927. Barium X ray investigation in 1927 and again in 1931 revealed no cause for his symptoms. The attacks became more severe and, in the most recent attack, he vomited. He was admitted to the Royal Devon and Exeter Hospital as a case of acute intestinal obstruction, but the diagnosis was revised in time to save him from operation. There is no history of headache, fits, muscular weakness, or any previous disability. He has drunk cider all his life, and admits to two pints daily, which he invariably obtains from house K. When examined he was not pale. A stippled blue line was present on the gums. Blood pressure 120/90. No other abnormality found.

Laboratory findings.—Blood: red cells 4,000,000 per c.mm., hæmoglobin 46 per cent., punctate basophilia present. Urine: lead present, no albumin.

CASE 10.—S. T., aged 59, a farm labourer, has during the last year had two severe attacks of colicky abdominal pain and constipation, each lasting from two to three days. In the second attack he vomited, and was admitted to the Royal Devon and Exeter Hospital as a surgical emergency. No operation was performed. There is no history of headaches, fits, or muscular weakness. He has been a cider-drinker for one year, and admits to two to three pints daily, which he obtains from houses K and L. He states that the cider is drawn through an engine in house K, but that it comes straight from the wood in house L. When examined he was not pale. A doubtful stippled blue line was present on the gums. Blood pressure 125/85. No other abnormality found.

Laboratory findings.—Blood: punctate basophilia present. Urine: lead present, no albumin.

2. SYMPTOMLESS CASES

CASE 11.—U. V., aged 39, a golf club steward and barman, had ascites in January, 1931, which was thought to be due to portal cirrhosis, and which cleared up completely in two months without special treatment. He had a "nervous breakdown" three years ago, and an injury to the seventh cervical vertebra during the war. This resulted in weakness of the left arm and right leg, on account of which he was invalided out of the Army. There is no history of headache or fits. He admits to having drunk four pints of cider daily since 1918 until he developed ascites, since when he has substituted beer. He frequents houses A, B, and D. He was a pale, thin, slightly built man, with carious teeth and a doubtful stippled blue line on the gums. There was a fine tremor and wasting of the small muscles of both hands, especially the left. Blood pressure 120/80. No other relevant abnormality found.

Laboratory findings.—Blood: punctate basophilia not present. Urine: no lead, no albumin.

CASE 12.—W. X., aged 30, a labourer, has no medical history. He admits to two to six pints of cider daily. He usually has his first drink at 11 A.M., and sometimes has the first drink drawn. He frequents houses A, B, E, F, and G. On examination nothing abnormal was found, except a fine tremor of the hands. Blood pressure 140/80.

Laboratory findings.—Blood: punctate basophilia not present. Urine: a trace of lead present, no albumin.

CASE 13.—Y. Z., aged 64, a general labourer, has no medical history. He admits to six pints of cider daily, all obtained at house A. There was a stippled blue line on the gums round his few remaining teeth. Blood pressure 140/80. No other abnormality found.

Laboratory findings.—Blood: slight punctate basophilia. Urine: lead present, no albumin.

NOTE ON LABORATORY METHODS EMPLOYED

The blood films were fixed with methyl-alcohol and stained with Unna's alkaline methylene-blue solution.[4] For the detection of lead in the urine, L. T. Fairhall's chromate method was used[5]; five or six days' output of urine being collected under toluol in each case. The estimations were not carried further than the stage of precipitation of lead chromate and are therefore only qualitative. Every urine was also examined by J. C. Thresh's sulphate method,[5] and the results were comparable.

Examination of Public-houses and Cider

Eleven public-houses came under suspicion. Ten of them are in this town, the eleventh in a village ten miles away. Inquiries into the methods of cider storage and supply to consumers were made in all cases, but it was not found practicable to obtain samples of cider for analysis in every case. As a

[4] Medicine, Baltimore, 1925, iv., 1.
[5] The Analyst, 1924, xlix., 124.

preliminary step, two houses (B and C) were investigated, in which the cider was known to be drawn from cask to engine through 12 to 16 ft. of lead piping. In each case a sample of cider was taken direct from the cask—i.e., as supplied by the manufacturer—and proved, on analysis, to be lead-free. In each case, also, a sample of cider was drawn from the engine early in the morning, thus ensuring its having been in contact with the lead pipe all night. Both these samples proved, on analysis, to contain 1/15 gr. per gallon of lead. In consequence of this, and in accordance with instructions from the county medical officer of health, all the houses in the area were warned to desist from using lead pipes for drawing cider. Some months later it was brought to our notice that four publicans (houses, A, D, G, and I) were still drawing cider through lead pipes lined with tin. They had been assured by the makers of such pipes that absorption of lead could not occur from them, and that they were perfectly safe cider conductors. To test this assertion, samples of cider were collected from the engines of the four houses in question. In all these cases the cider was drawn in the afternoon, after it had been standing in contact with the tin-lined pipes for three hours. Analysis of these four samples revealed the presence of lead in all of them in amounts varying from 1/20 to 1/10 gr. per gallon. Samples of cider taken direct from the wood in these four houses were lead-free. In the remaining houses in this town (E, F, H, and J) the cider was known to be drawn direct from the wood. The facts concerning the village house K are suggestive but not conclusive. Cases 9 and 10 came from the same village, and were in the habit of drinking cider at the same public-house K. The publican, on being questioned, maintained that it was his invariable custom to draw cider direct from the wood. A sample of this cider was accordingly analysed and found to be lead-free. Since, however, both patients insisted that they had been served at this house with cider drawn through an engine, further discreet inquiries were made in the neighbourhood which elicited evidence in support of their statements. Nevertheless, the charge must remain non-proven, since no sample of engine cider could be obtained for analysis. The cider in house L, which was known to be drawn straight from the wood, was not investigated.

Analysis of Cider for Lead

House.	Patients frequenting.	Method of drawing cider.	Make of cider.	Result of analysis for lead:—Cider from cask: nil in all samples examined. Cider through pipe (gr. per gallon).
A	7	From engine through a tin-lined pipe.	Proprietary brand X.	1/10
B	6	From engine through lead pipe.	Proprietary brand Y.	1/15
C	5	„ „	Proprietary brand Z.	1/15
D	5	From engine through a tin-lined pipe.	Farm-brewed.	1/10
E	6	From wood.	„ „	—
F	5	„ „	Home-brewed at house G.	—
G	6	From engine through a tin-lined pipe.	Home-brewed.	1/10
H	2	From wood.	Proprietary brand Y.	—
I	2	From engine through a tin-lined pipe.	Proprietary brand Y; also farm-brewed.	1/20
J	1	From wood.	Proprietary brand X.	—
K	2	Doubtful.	Not known.	Not known.

NOTE ON METHOD OF ANALYSIS OF CIDER FOR LEAD

The detection and quantitative estimation of lead in all the above samples of cider was carried out by Mr. Thomas Tickle, public analyst to the county of Devon, whose assistance we desire gratefully to acknowledge. The process he used was to remove organic matter by oxidation with nitric acid in the presence of concentrated sulphuric acid. After evaporating the sulphuric acid to eliminate the effect of iron by the method described by R. Wilkie [6] he matched the colour produced by sodium sulphide with that given in like association by a known quantity of lead.

Summary.

1. The occurrence of a small outbreak of lead colic in a Devonshire town is recorded.

2. The source of lead in the cider causing this outbreak was found to be the conducting pipes used in certain public-houses to draw cider from cask to engine.

3. Clinical notes are given of ten cases with symptoms. The following characteristics were common to all: attacks of colic and constipation; a stippled blue line on the gums; punctate basophilia; excretion of lead either in the urine or fæces. Four cases had muscular weakness or wasting, with tremors. In three cases the abdominal symptoms were so severe as to warrant a diagnosis of acute intestinal obstruction, and in one case the abdomen was explored. Albuminuria was found in two cases. No further acute symptoms of lead poisoning were observed after the patients had been warned against drinking cider drawn from the engine.

4. Clinical notes are given of three symptomless cases. Of these, two had a stippled blue line on the gums, two were excreting lead in the urine, and one had punctate basophilia.

5. Eleven public-houses were investigated. In six of these lead was found in the cider as drawn by the bar engine, though samples from the cask were in all cases investigated free from lead.

6. None of the cases coming to our notice occurred among pure beer drinkers, although lead pipes have been, and in some cases still are, used for conducting beer. This points to the conclusion that cider is a more active solvent of lead than is beer, owing to its greater acidity.

7. We would also suggest that the acidity of cider tends to keep the lead mobilised in the tissues, and therefore liable to produce symptoms of plumbism more readily than similar quantities ingested in a more alkaline medium, such as water or beer.

8. The occurrence of this outbreak shows that the possibility of plumbism from this source should always be kept in mind in cider-drinking areas.

In addition to Mr. Tickle, our thanks are due to Dr. Donald Hunter for his persistent help and encouragement; to Dr. W. Robb, pathologist to the Royal Devon and Exeter Hospital, for allowing one of us to use his laboratory and apparatus, and for his skilled help and advice; to Dr. Horton Date, assistant county medical officer of health; to Dr. H. F. L. Hugo, the local medical officer of health; and to Drs. Roper, Fuller, and Seward, of the Royal Devon and Exeter Hospital, for allowing us access to their patients and case notes. A word of praise is due to the patients, many of whom allowed themselves to be investigated in spite of being free from symptoms at the time; and finally to the publicans, who coöperated in a public-spirited manner.

[6] Jour. of the Soc. of Chem. Industry, 1909, xxviii., 636.

MORTALITY FROM HÆMATEMESIS

A SUPPLEMENTARY ANALYSIS

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In 1927 I recorded [1] the mortality of all cases of hæmatemesis admitted to the medical wards of the General Hospital, Birmingham, between January, 1902, and July, 1926; the present investigation covered the period between August, 1926, and December, 1931. In both of these series every case admitted to the medical wards on account of hæmatemesis has been included, and in the present series three cases in which a hæmatemesis occurred soon after admission. Many cases who are admitted for the treatment of a peptic ulcer give a history of the vomiting of "coffee-grounds," or even of a small quantity of blood—these cases do not come within the scope of the inquiry; this point is an important one, and it is particularly to be noted that my results show the mortality of cases for whom admission to hospital is sought, as medical emergencies, for the treatment of hæmatemesis as the leading, often the only, symptom.

A summary of the 1902–26 series is given in Table I.

Table I.—*Cases of Hæmatemesis, 1902–26*

Disease.	Cases.			Deaths.			P.M.'s.
	M.	F.	Total	M.	F.	Total	
Acute ulcers ..	71	147	218	13	6	19	15
Chronic ulcers ..	89	160	249	15	14	29	23
Total ulcers ..	160	307	467	28	20	48	38
Hepatic cirrhosis ..	..	..	25	..	..	8	7
Gastric cancer ..	..	..	7	..	..	6	4
Portal thrombosis ..	..	..	1	..	..	1	1
Melæna neonatorum ..	..	..	2	..	..	1	1
Doubtful cases ..	..	..	24	..	..	3	2
Total			526			67	53

The peptic ulcer group (1902–26) may be analysed as follows:—

Acute ulcers.—Of 218 cases, 19 died—excluding one death which was due to perforation and peritonitis the mortality was 8·3 per cent.; the males showed a mortality of 16·9 per cent.; females, 3·1 per cent.

Chronic ulcers.—Total mortality of 11·6 per cent.; males, 16·8 per cent.; females, 8·7 per cent.

Total ulcers.—Total mortality of 10·7 per cent.; males, 16·8 per cent.; females, 6·5 per cent.

A corresponding summary of the 1926–31 series is given in Table II.

Table II.—*Cases of Hæmatemesis, 1926–31*

Disease.	Cases.			Deaths.			P.M.'s.
	M.	F.	Total	M.	F.	Total	
Acute ulcers	30	9	39	5	2	7	7
Chronic ulcers	50	22	72	9	2	11	10
Total ulcers	80	31	111	14	4	18	17
Hepatic cirrhosis ..	..	..	5	..	..	4	3
Gastric cancer	..	..	3	..	..	3	3
Cirrhosis carcinomatosa	..	..	1	..	..	1	1
Doubtful cases ..	..	..	3	..	..	1	0
Total			123			27	24

[1] The Lancet, 1927, ii., 168. An error crept into the summary of this paper—the mortality from acute gastric ulcers in females was given as 8·7 per cent. instead of 3·1 per cent.

ACUTE ULCERS, 1926–31

No attempt has been made to differentiate acute gastric from acute duodenal ulcers on clinical grounds; the evidence from the post-mortem room is included.

Mortality in acute ulcers.—There were 7 deaths in the 39 cases—a mortality of 18 per cent.; of 30 males, 7 died—a mortality of 16·6 per cent.; of the 9 females, 2 died—a mortality of 22·2 per cent.

Cause of death: hæmorrhage alone, 4 cases; secondary broncho-pneumonia, 1 case; hæmorrhage with unsuccessful surgical treatment for its arrest, 2 cases.

Site of ulceration: no autopsy, 1 case; duodenum, 2 cases; lesser curvature, middle, 3 cases; pyloric antrum near greater curvature, 1 case.

Notes on the cases treated surgically.—The difficulties of surgical treatment are sufficiently emphasised in the case notes:—

Boy, aged 17. Admitted Sept. 10th, 1931; died Sept. 17th. He gave a rather indefinite history of pain after food for three months; he was admitted on account of a profuse hæmatemesis, and treated by starvation, rectal salines, and morphine; as the bleeding persisted a blood transfusion was given, and the bleeding stopped. It soon started again, and he was submitted to an operation. No ulcer could be identified externally, so the stomach was opened in the region of the pyloric antrum; a small area of thinned mucosa was found and invaginated. The bleeding persisted, and the patient died of it.

Post mortem.—Stomach: on the anterior surface there was an area of hæmorrhage covering the region of the exploratory incision, and the pyloric region had been sutured *but not in the region of the ulcer*, which was found only after searching very carefully on the anterior surface near the greater curvature; it could only have been found if the edges of the incision had been everted. There was no thickening, and it was impossible to palpate it from the outside or the inside, and by no means easy to find it at the autopsy. The ulcer was shallow, 1·2 by 0·8 c.cm., extending through the mucosa, and the central part extended into the submucosa, a small mass of fibrin covered two openings—the severed ends of a small artery.

Man, aged 49 years. Admitted Sept. 1st, 1931; died Sept. 5th. He gave a short history of dyspepsia, and was admitted after a profuse hæmatemesis; he rapidly got worse under the usual medical treatment, and was submitted to a laparotomy after a blood transfusion. The surgeon found a small thickened duodenal ulcer which he invaginated, but the patient died.

Post mortem.—Stomach: immediately beyond the pylorus there was a small and quite superficial acute duodenal ulcer extending down to the submucosa, a branch of the gastro-duodenal artery in its floor was eroded.

Age- and sex-incidence is set out in Table III.

Table III.—*Age- and Sex-incidence of Acute Ulcers*

Ages.	Under 20	21–30	31–40	41–50	51–60	61–70
Males	2	8	7	8	4	1
Deaths	1	0	1	2	1	0
Females	0	2	2	3	1	1
Deaths	0	0	2	0	0	0
Total	2	10	9	11	5	2
Deaths	1	0	3	2	1	0

CHRONIC ULCERS, 1926–31

Mortality.—Out of a total of 72 cases, 11 died—a mortality of 15·2 per cent. Of the 50 males, 9 died—a mortality of 18 per cent. Of the 22 females, 2 died—a mortality of 9 per cent.

Cause of death: hæmorrhage alone, 6 cases; cerebral thrombosis, 1 case; perforation, 2 cases; tuberculous meningitis, 1 case; hæmorrhage in a patient with chronic nephritis, 1 case. Some amplification is needed to justify the inclusion of one of these cases and the omission of three of them in arriving at the correct mortality from *hæmatemesis*.

Man, aged 49. Admitted July 8th, 1926; died July 15th. He gave a history of gastric ulcer of five years' duration,

and was admitted after a severe hæmatemesis in a collapsed condition; he made a good recovery, and the bleeding stopped, but the ulcer perforated on July 15th, and he died on the operating table before the operation was started.

Post mortem.—A large perforation of a very large, chronic, saddle-shaped ulcer of the lesser curvature.

Woman, aged 56. Admitted Nov. 13th, 1928; died Nov. 21st. She gave a two years' history suggesting a gastric ulcer, and she was admitted three days after a severe hæmatemesis; her progress was satisfactory until a perforation of the ulcer occurred on Nov. 21st; she died soon after operation. *Post mortem* showed perforation of a large and very chronic ulcer on the middle of the lesser curvature of the stomach, complicated by general peritonitis.

Man, aged 49. Admitted June 18th, 1926; died June 30th. He gave a long and rather indefinite history of dyspepsia, and was admitted with hæmatemesis and melæna of a week's duration. He did very well, but 12 days after admission he had a fit, collapsed, and died in coma in eight hours. *Post mortem.*—The stomach showed three ulcers, one almost encircling the organ and starting at the greater curvature, a second near the cardia, and healed, and a third on the greater curvature proximal to the first with an eroded vessel in its base. The left kidney showed extensive tuberculous disease, and miliary tuberculosis was present with tuberculous meningitis.

Man, aged 58. Admitted March 9th, 1927; died March 13th. The patient had a history of a duodenal ulcer for two years; he was admitted blanched after a hæmatemesis, and in spite of this his blood pressure was 230/170. The bleeding proved to be uncontrollable, and he died. *Post mortem.*—A circular chronic ulcer was found in the first part of the duodenum, with an eroded vessel at its base; the kidneys showed an advanced condition of primary granular contracted kidney.

Corrected mortality.—In reckoning the mortality from the point of view of hæmatemesis, it would seem permissible to exclude the two cases of perforation, and the case of tuberculous meningitis. This would give a corrected mortality as follows:—

72 cases with 8 deaths—mortality 11·5 per cent.
50 males „ 7 „ — „ 14 „
22 females „ 1 death— „ 4·5 „

The sites of the ulcers in the fatal cases were as follows: no autopsy, 1 case; duodenum, 2 cases; lesser curvature, middle, 3 cases; cardia (3 ulcers), 1 case; greater curvature, near cardia, 1 case; œsophagus and pylorus, 1 case; pylorus, 2 cases.

Chronic gastric and duodenal ulcers.—On clinical and other grounds the following differentiation was made:—

	Cases.
Gastric ulcers (X ray, operation, or autopsy confirmation)	24
Gastric ulcers (clinical diagnosis without confirmation)	34
Duodenal ulcers (X ray, operation, or autopsy confirmation)	9
Duodenal ulcers (clinical diagnosis without confirmation)	5

The age- and sex-incidence is set out in Table IV.

TABLE IV.—*Age- and Sex-incidence of Chronic Ulcers*

Ages.	Under 20	21–30	31–40	41–50	51–60	61–70
Males	2	2	10	22	13	2
Deaths	0	0	1	2	4	2
Females	1	5	5	5	2	3
Deaths	0	0	0	0	1	1
Total	3	7	15	27	15	5
Deaths	0	0	1	2	5	3

ACUTE AND CHRONIC ULCERS TOGETHER

The gross mortality from acute and chronic ulcers, 1926–31, was as follows:—

Total cases, 111; deaths, 18; mortality, 16 per cent.
Males, 80; „ 14; „ 17·5 „
Females, 31; „ 4; „ 12·9 „

The corrected mortality, reached by exclusion of two deaths from perforation and one death from tuberculous meningitis, was as follows:—

Total cases, 111; deaths, 15; mortality, 13·5 per cent.
Males, 80; „ 12; „ 15 „
Females, 31; „ 3; „ 10 „

Severity of the hæmorrhage.—In Table V. the cases have been separated into those admitted in the first attack of hæmatemesis and those who gave a history of previous attacks; the classification, according to the severity of the bleeding, is somewhat arbitrary.

TABLE V.—*Severity of Hæmorrhage*

Severity of bleeding.	Cases.	
	First attack.	History of previous attack.
Fatal	17	2
Collapsed on admission	18	2
Severe	52	9
Moderate or slight	10	1

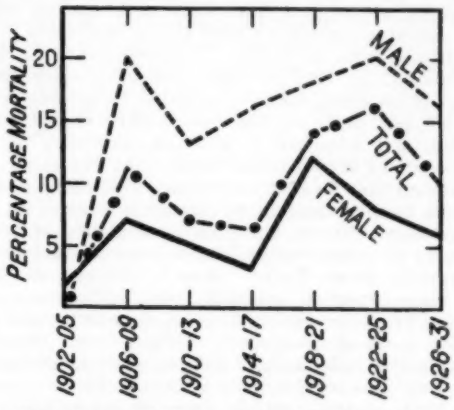
HÆMATEMESIS IN PEPTIC ULCER

The mortality from hæmatemesis in peptic ulcer (1902–31) may be summarised as follows:—

Total cases.—Of 578 cases, 66 died; excluding 3 deaths from perforation and 1 death from tuberculous meningitis, the mortality is 10·7 per cent.

240 males with 39 deaths—mortality, 16·2 per cent.
338 females „ 23 „ — „ 6·8 „
Acute cases—
257 cases with 25 deaths—mortality, 9·7 per cent.
101 males „ 17 „ — „ 16·8 „
156 females „ 8 „ — „ 5·1 „
Chronic cases—
321 cases with 37 deaths—mortality, 11·5 per cent.
139 males „ 22 „ — „ 15·7 „
182 females „ 15 „ — „ 8·2 „

The percentage mortality from hæmatemesis, 1902–31, is illustrated in the Figure.



Percentage mortality from hæmatemesis, 1902–31.

TREATMENT

It was not possible to account for a low or a high mortality by differences in treatment; the methods adopted appear to have been fairly constant at each stage, and did not differ from the treatment used at other centres. At the present time the treatment is morphine, a period of starvation with rectal salines, and later a graduated diet with alkalis. Blood transfusion has been frequently resorted to when the bleeding has persisted or other indications have presented themselves. Two cases were submitted to

operation with fatal results; in one case gastric lavage was used and the patient recovered.

COMMENT

I wish to make no comment on the figures in this paper; I was led to bring the 1902–26 series up to date in order to see whether the mortality had changed; but with a much smaller series it appears that the difference is not marked. In Birmingham over a period of 30 years the experience of one hospital suggests a mortality in hæmatemesis from peptic ulcer of about 10 per cent.—the death-rate among men being at least double that among women, and occurring at rather a later age-period.

Finally, I must express my thanks to the members of the honorary medical staff of the General Hospital, Birmingham, for allowing me to publish the cases.

MORTALITY OF SEVERE HÆMORRHAGE FROM PEPTIC ULCERS

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Peptic ulceration of the stomach is likely to be attended by several complications, each of which calls for urgent treatment if the patient's life is to be saved. It is not sufficiently recognised that, apart from perforation or occlusion of the pylorus by scar tissue, there is a very considerable proportion of cases in which persistent or gross hæmorrhage is the direct cause of death, and there appears to be no unanimity of opinion on the treatment of these patients. Hurst,[1] for instance, said at a discussion at the Royal Society of Medicine in 1924: "I believe that hæmorrhage from gastric and duodenal ulcers is far less often fatal than is generally supposed. I have never had a case under my care in which death resulted, although I have only once had to call in the aid of a surgeon to save the patient's life." He reaffirmed this in 1929.[2] Paterson,[3] at the same discussion, in dealing with collected statistics of London hospitals, found a mortality from hæmorrhage of 3·8 per cent. in 1343 medically treated peptic ulcers, and admitted a probable mortality of 11·8 per cent. in severe hæmorrhage. At the same time he stated that he had yet to see a death from hæmatemesis from a gastric or duodenal ulcer. On the other hand, Hinton [4] records a mortality of 20 per cent. in 52 cases of gross hæmorrhage at the Bellevue Hospital, New York; Ross [5] 58 per cent. in 45 cases treated medically in Melbourne; and Lynch [6] 12·9 per cent. in 31 cases of gross hæmorrhage under medical treatment. There are, therefore, considerable differences of opinion as to the mortality-rate from this complication of peptic ulcer.

I have analysed all the cases of peptic ulcer and its complications admitted to St. Thomas's Hospital during the period 1925–31 inclusive; these included simple gastric, duodenal, and jejunal ulcers, perforated ulcers, and pyloric obstruction from scarring. The mortality from all causes in proved peptic ulcers was 11·3 per cent. in 1410 males and 8·4 per cent. in 402 females, representing a total mortality of 10·8 per cent.

Admissions for gross hæmorrhage, requiring urgent attention owing to sudden loss of blood by hæmatemesis or by the bowel, numbered 137 males and 54 females; hæmorrhage was the predominant feature in each of these cases. The mortality in patients admitted for hæmorrhage was 27 per cent. in males and 15·6 per cent. in females—a total mortality of 25 per cent., equivalent to that of perforated ulcers in this group. All these cases of hæmorrhage were treated by medical means, including complete rest, rectal salines, and morphia; about one-quarter received alkalis by mouth; 15 cases were transfused. Various hæmostatics were used in a number of cases without any convincing results. Washing out of the stomach with ice-cold water, as advocated by Hurst,[1] was not, however, adopted in any case. In view of these figures it is impossible to regard the medical treatment employed as entirely satisfactory. When we come to consider the advisability of calling in the surgeon there is, in view of the patient's general condition, a natural hesitation. Exsanguinated patients, even when transfused on the table, are a bad operation risk.

INDICATIONS FOR SURGICAL TREATMENT

The question therefore arises: is there any indication of the type of case in which medical treatment is likely to fail? As far as my figures go, it is exceptional for a single hæmorrhage from a peptic ulcer to lead to death. The striking fact about the fatal cases is that in all of them the hæmorrhage continued or recurred after admission to hospital, in spite of medical treatment. When hæmorrhage was still continuing, or recommenced after 24 hours of treatment, it indicated that a bleeding point was present which could not readily be occluded by medical means.

Of the admissions for gross hæmorrhage, bleeding continued or recurred 24 hours after coming under treatment in 48 male and 14 female cases; of these, 38 males and 8 females died, a mortality of 74 per cent. Post-mortem examinations on 45 of these patients revealed that the common cause of repeated hæmorrhage was a partially eroded vessel of considerable size in the floor of an ulcer, the type of ulcer being callous in 30 cases and acute in 7 cases; multiple ulcers were present in the other cases. The site of the ulcer was in the stomach in 31 cases, in the duodenum in 8 cases, and at the pylorus in 5 cases. One case showed both a callous ulcer in the duodenum and an acute lesion, with bleeding, in the stomach; whilst in another the pathological examination revealed no definite bleeding point, death being attributed by the pathologist to gastrostaxis. Eleven of these cases were under 40 years of age, with 7 deaths; 40 were between 40 and 60, with 28 deaths; while 11 cases over 60 years were all fatal. Four cases were complicated by parotitis, 1 by pneumonia, and 2 by aortic aneurysm.

The duration of dyspeptic symptoms was very variable. The shortest history among the fatal cases was only three days, but many had a history of ten years or more. In some cases, where the history was of only a few weeks, the ulcer was reported by the pathologist to be of the chronic type, while in others with a long history the hæmorrhage appeared to have arisen from an acute superficial ulcer. In most cases the hæmorrhage continued for several days, and in one case there was continued bleeding for one month before death; the shortest time from the onset of hæmorrhage to the death of a patient was 48 hours. There was, therefore, ample time for surgical interference in all the fatal cases if it had been considered desirable.

In general, medical treatment should be given a fair trial in cases of severe gastric hæmorrhage, provided there is a reasonable chance of its success and valuable time is not lost, but there certainly seem to be cases in which surgical intervention should

be seriously considered. While I do not suggest that indiscriminate operative treatment should again be introduced in all cases of severe gastric hæmorrhage, it is obvious from the above figures and post-mortem findings that in the group of cases presenting a 74 per cent. mortality, operative interference in carefully selected cases might have improved the recovery-rate.

My thanks are due to Prof. O. L. V. de Wesselow for help and encouragement, and to the staff of St. Thomas's Hospital for allowing me to publish these figures.

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VITAMIN-A CONTENT OF THE LIVER IN PUERPERAL SEPSIS

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In the course of an investigation [1 2] into the effect of treatment of cases of puerperal sepsis with concentrated preparations of vitamin A, the vitamin-A content of the liver was determined in those cases coming to autopsy.

It soon became obvious that under these conditions the liver was often fairly rich in this vitamin, but occasional very low values, in spite of the ingestion of large quantities of the vitamin, gave a more definite interest to the work. In the absence of any detailed figures as to the vitamin-A content of the livers of normal individuals, it was, however, difficult to assess the significance of the findings. It is obviously impossible to use healthy puerperal women as a basis of comparison, but the investigations of L. K. Wolff and T. Moore* provide some indication of the vitamin-A reserves of the liver in normal people. Investigations previous to these had shown that wide variations in the vitamin-A content of the liver occurred in disease, and the more recent work shows that similar variations also appear in the healthy. The general level of the vitamin-A reserves in health does indicate, however, that such low values as were found in some puerperal cases of the present series were abnormal.

Technique.—The vitamin-A content of the liver was determined by the antimony trichloride test on the unsaponifiable fraction of the liver fat, the blue value being estimated in the Lovibond tintometer. The amount of vitamin A present is expressed in the form of the blue unit used by Moore,[3] so that direct comparison with his findings is possible.

Cases Treated with Vitamin A

In Tables I. and II. the essential details in 20 cases of puerperal sepsis treated with vitamin A are given. The septicæmic and non-septicæmic cases are separated in order to show that the vitamin-A reserves, where there was a general infection of the blood stream, were not in general lower than where the infection was more localised.

The vitamin-A preparations given were an arachis oil solution of mammalian liver fat and a more concentrated unsaponifiable extract from another source of mammalian liver fat. The former preparation usually provided the bulk of the vitamin given. Both preparations were periodically tested by the antimony trichloride test. The figures given in the tables under the heading of "Amount of vitamin A ingested" are necessarily approximate, since they are based on a pharmaceutical dosage. The quantity of preparation given on the day of death is not included in the estimate. The total content of the liver in vitamin A was calculated, in those cases where the exact weight of the liver was not known, by assuming the weight of the liver to be 1700 g.

It will be noted that whilst those cases receiving the larger quantities of vitamin tended to show the greater degree of vitamin-A reserves in the liver, this relation is by no means absolute, and there are some very anomalous cases. Cases 2 and 6 (Table I.) are prominent in this respect, whilst the cases in Table II. are grossly irregular, the two cases which had received the greatest amounts of vitamin showing the least reserves. The most striking instance of this disparity between the amount of ingested vitamin and the amount found in the liver is Case 1 (Table II.), where, though 15,000,000 units were given, the whole liver contained roughly only 1000 units. Other examples of this failure of the liver to retain the ingested vitamin may easily be found.

In the whole 20 treated cases the average amount of vitamin A in the liver was only 15 per cent. of the average total amount taken by mouth—excluding the vitamin A in the general diet, which in many cases was considerable in amount. The actual amount of vitamin A retained by the liver must, however, have been much lower than this percentage figure would indicate, for it is very unlikely (vide values for untreated cases, Table IV.) that the liver was usually devoid of vitamin at the commencement of treatment. Assuming (vide infra) that 10 per cent. of the ingested vitamin is lost in the fæces, and that the average content of the liver was that of the group of untreated septic cases (Table IV.), the average amount of the absorbed vitamin retained by the liver is found to be 8 per cent.

In a few cases it seems possible that a much larger proportion of the vitamin was taken up by the liver. Prominent amongst these are Cases 7 (Table I.) and 6 (Table II.), but it may well be that in these instances the original content of the liver in vitamin A was relatively high prior to the commencement of treatment.

FATE OF THE INGESTED VITAMIN

It is thus obvious that either a large proportion of the vitamin preparation taken by mouth was not absorbed or, if absorbed, was rapidly excreted or destroyed. The question of absorption has not been fully investigated, but Rowntree [4] studied this question in children, using a biological technique for the estimation of vitamin A in the fæces, and came to the conclusion that absorption depended upon the absorption of fat. The loss of vitamin A in the fæces varied from 2 to 12 per cent., the largest loss occurring with the largest intake. The fæcal content of vitamin A was estimated in two cases of the present series, and the loss by this route estimated at about 5 per cent., but no particular attention was paid to this point at the time, for its significance was not then realised. Further work is in progress on the question of alimentary excretion of vitamin A in cases of sepsis, and the preliminary results do not indicate a very large loss in this way. Failure to absorb the vitamin is therefore not likely to account for anything but a relatively small fraction of the unrecovered vitamin in the puerperal cases.

There is little evidence that urinary excretion accounts for any significant loss. Experiments in dogs

* Dr. Moore's paper appeared in our last issue. Prof. Wolff's was published on Sept. 17th (p. 617).

and men submitted to a diet very rich in vitamin A (including large doses of cod-liver oil), carried out by Cooper,[5] suggest that a little vitamin A may be found in the urine under these conditions, but Rowntree [4] found no evidence of alimentary vitaminuria in children, even when the diet was very rich in vitamin A.

It must be concluded therefore, that when very large amounts of vitamin A pass into the liver, the liver cell (at least in the septic cases which were examined) is unable to incorporate most of the vitamin before it is either destroyed in the liver or passes into the general circulation. In the blood stream it is probably rapidly oxidised, for there is now good evidence that relatively very small quantities of vitamin A are stored in organs other than the liver.

COMPARISON WITH EXPERIMENTAL RESULTS IN ANIMALS

This failure of the liver cell to take up rapidly large quantities of vitamin A is also to be observed in animals. In rats the liver content of vitamin A only rises in a gradual manner when amounts much in excess of its normal requirements are fed, and there is no sudden increase when extremely large amounts of the vitamin are fed. Even when the vitamin is given intravenously, the liver fails to retain much of the vitamin presented to it as the experimental details (typical of several similar experiments) given in Table III. illustrate.

TABLE III.—*Effect of Intravenous Inoculation of Vitamin A on the Liver Reserves of the Rabbit*

No. of rabbits.	b.u. injected (average).	Total b.u. in liver (average).
4 (healthy)	158,000	71,000
3 (severe general tuberculosis) ..	290,000	32,000
4 (healthy controls)	0	18,000

Injections of an emulsion of a vitamin-A liver concentrate were given over an average period of nine days in the healthy rabbits, and over a period of 55 days in the tuberculous animals. In the healthy rabbits about two-thirds of the injected vitamin was not found in the liver or body generally, whilst in the tuberculous rabbits the disparity was very marked, only about 5 per cent. (allowing for the control values) was recovered, which suggests either that the normal capacity of the liver cell to store the vitamin was injured by the infection (the liver itself was not infected), or less possibly that utilisation of the vitamin was much increased by the tuberculous infection.

Carotene, the precursor of vitamin A, was still more rapidly destroyed when given intravenously in the healthy rabbit, for less than 25 per cent. was recovered from the body 30 minutes after the injection.

In the human cases, of course, the interpretation of the results is complicated by the presence of a very severe infection, and there can be little doubt that the degenerated condition of the liver cells so commonly found in severe infections was responsible in varying degree for the marked inability of the liver to retain the vitamin.

I have found some experimental support for this view. When a group of rats were given huge doses of cod-liver oil for a period of over one year the liver content of vitamin A was found to reach high levels in many cases, but in some the content was relatively, and in a few actually low. The livers of these animals showing low reserves were always in an advanced state of fatty degeneration and infiltration, due to the toxic action of the excess cod-liver oil, and possibly, in some degree, to the tuberculous infection to which the rats were submitted.

Cases with Low Reserves of Vitamin A

In the whole series of 27 treated and untreated cases of puerperal sepsis (Tables I., II., and IV.) 8 had a vitamin-A content per g. of liver of less than 50 b.u. A striking fact is that 5 of these cases had received sufficient vitamin A by mouth to raise the liver content to high levels, provided it had been retained.

It is also to be noted, though in such a small number of cases the association may be accidental, that 5 of the 8 cases with low vitamin-A reserves had extensive septic thrombo-phlebitis. Only 2 out of the total 7 cases showing this complication in severe form gave a value of more than 50 b.u. per g. of liver, and even in these two exceptions the liver content was not high, particularly in view of the very large amounts of vitamin given by mouth. The significance of this latter point is more obvious when it is realised that in one exception (Case 2, Table I.), where the b.u. per g. were 205, this figure would have been 3228 if all the ingested vitamin had been retained, and in the other exception the figure would have been 1765 instead of the determined value of 88.

In two of the cases of thrombo-phlebitis associated with low vitamin-A reserves (1 and 2, Table II.) the liver was examined histologically, and in both cases there was extensive cell necrosis at the periphery of the lobule, together with marked fatty degeneration and infiltration, a condition which was particularly severe in one case (1). The complete failure of the liver to retain the vitamin, in this case, has been already noted.

That there may be some relation between extensive venous thrombosis and low vitamin-A reserves seems more possible in view of the findings of Moore, for in six cases noted in his series, three had livers completely devoid of vitamin A. Moreover, Wolff points out that the liver content was considerably below the average in seven cases of lung embolism occurring in his series.

A probable explanation of these findings is that the toxic or degenerated state of the liver cell due to the extensive infection of the systemic veins was responsible for its failure to retain the vitamin presented to it, so that the vitamin originally present was utilised by the body without the loss being rectified from the incoming supplies from the intestine. Another possibility is that the original vitamin-A content of the liver prior to the onset of disease was low, and this condition predisposed to venous infection and thrombosis. There seems, however, no obvious reason why vitamin-A deficiency should predispose particularly to this complication, but since one liver function was so disorganised the possibility that failure of some other liver function may be responsible for the onset or prolongation of a thrombosed condition of the large veins should be considered.

THE VITAMIN-A RESERVES IN PUERPERAL WOMEN

The findings in seven women who died of non-septic disease are given in Table V. The cases are too few to warrant analysis or comparison with the septic cases, but they are included as they show two instances of low vitamin-A reserves. In one, a case of eclampsia, the liver was devoid of vitamin A—possibly another instance of liver degeneration. The other is

TABLE I.—*Findings in Twelve Cases of Puerperal Septicæmia*

Case.	Age.	Gravida.	Type of blood infection.	Duration of illness (days).	Duration of treatment (days).	Amount vitamin A ingested (1000 b.u.).	Vitamin A in liver.		Percentage relation of b.u. ingested to total b.u. in liver.	Autopsy findings.
							b.u. per g.	Total b.u. in liver (1000 b.u.).		
1	42	3	*Strep. hæmolyticus.*	36	28	6092	1056	2059	34	Malignant endocarditis tricuspid valve. Uterine mucosa ulcerated.
2	33	3	Strep. (anaerobic). Tetrad cocci (anaerobic). Gram + bacillus.	27	23	4762	205	307	6	Pus in cave of Retzius. Septic thrombophlebitis in l. ovarian vein, l. renal vein, and inferior vena cava.
3	21	1	*Strep. hæm.*	28	21	4633	440	748	16	Septic infarcts r. lung. Very advanced fibrinous pericarditis. Breast abscess.
4	29	1	Strep. (anaerobic) *Bact. coli. Strep. fæcalis.*	31	20	4470	590	1003	22	Abscesses in broad ligament and uterine wall. Septic thrombo-phlebitis l. ovarian vein.
5	23	1	Staphylococcus.	12	11	2887	345	553	19	Malignant endocarditis tricuspid valve. Small abscess cavity in cervix. Abscess cavities in lungs.
6	24	1	*Bact. coli.*	8	7	1579	7	10	1	Small abscesses in uterine wall. Died of secondary hæmorrhage from uterus.
7	34	2	Mixed.	10	7	1201	539	916	76	Liver fat, high carotinoid content.
8	32	2	*Strep. hæm.*	6	4	995	66	112	11	General purulent peritonitis.
9	28	1	„ „	6	4	879	81	138	16	—
10	26	1	„ *viridans.*	10	5	858	26	44	5	Thrombo-phlebitis r. leg and all thoracic veins.
11	32	1	„ *hæm.*	10	3	493	62	105	21	General purulent peritonitis.
12	27	1	„ „	15	2	257	154	262	102	Malignant endocarditis tricuspid valve. Partial retention of placenta.

TABLE II.—*Findings in Eight Cases of Puerperal Sepsis. (Negative Blood Cultures)*

Case.	Age.	Gravida.	Duration of illness (days).	Duration of treatment (days).	Amount vitamin A ingested (1000 b.u.).	Vitamin A in liver.		Percentage relation of b.u. ingested to total b.u. in liver.	Autopsy findings.
						b.u. per g.	Total b.u. in liver (1000 b.u.).		
1	35	2	56	56	15,444	0·5	1	0	Thrombo-phlebitis arm and leg. Liver abscess; mesenteric abscess. Septic infarcts in lung. *Strep. hæm.* in blood. Fatty degeneration and necrosis of liver-fat content, 26 per cent.
2	38	3	22	15	3,432	4	7	0	Thrombo-phlebitis uterine veins, common iliac, and inferior vena cava. W.R. + +. Liver: extensive cell necrosis of eclamptic type without hæmorrhage. Fat content, 10 per cent.
3	28	1	31	17	2,911	88	150	5	Uterus septic. Thrombo-phlebitis ovarian veins and l. leg.
4	26	3	25	10	1,923	88	150	8	Interior of uterus septic and gangrenous, small abscess at fundus. R. ovarian abscess. Spreading gas-forming infection of abdominal wall.
5	19	1	17	8	1,785	407	570	31	Patient icteric. Septic infarcts in lung. Pelvic cellulitis.
6	23	1	6	5	1,051	757	1287	122	General purulent peritonitis (*Strep. hæm.*). Bilateral empyema and broncho-pneumonia.
7	24	3	8	4	686	0	0	0	Uterus septic. Septic thrombosis r. leg.
8	32	4	5	3	473	169	287	61	General purulent peritonitis (*Strep. hæm.*).

TABLE IV.—*Findings in Seven Cases of Puerperal Sepsis. (No Vitamin-A Treatment)*

Case.	Age.	Gravida.	Duration of illness (days).	b.u. per g.	Total b.u. in liver (1000 b.u.).	Autopsy findings.
1	28	2	—	387	658	Septicæmia (*Strep. hæm.*).
2	24	1	2	277	471	„ „ „
3	32	1	—	187	318	„ „ „
4	31	1	2	103	175	Uterine sepsis. Twins both dead. b.u. per g. liver (1) 79, (2) 34.
5	32	1	3	37	53	Antepartum accidental hæmorrhage. Acute nephritis.
6	28	1	5	33	56	Uterine sepsis.
7	26	2	22	14	24	Uterus septic. Thrombo-phlebitis of leg (r.) and pelvic veins.

TABLE V.—*Findings in Seven Non-septic Puerperal Cases*

Case.	b.u. per g.	Total b.u. in liver (1000 b.u.).	Autopsy findings.
1	651	920	Seven months' pregnant. Cæsarean section. Cirrhosis of liver of alcoholic type.
2	572	700	Acute yellow atrophy of liver.
3	156	265	Eclampsia.
4	99	190	Eclampsia. Necrotic hæmorrhagic areas in kidneys.
5	81	138	Bilateral cortical necrosis of kidneys.
6	24	41	Thirteenth pregnancy. Collapsed and died two days after labour. Multiple infarcts in both kidneys. Bilateral cortical necrosis of kidneys.
7	0	0	Eclampsia.

a case of bilateral cortical necrosis of the kidneys which is of interest, since in Wolff's series diseases of the kidney give a low average. It will be noted that two cases of disease of the liver (acute yellow atrophy and cirrhosis) show high vitamin-A reserves, which suggests that though the diseased cell may not be capable of taking up vitamin A, it may retain much or all of that present before the onset of disease.

PUERPERAL SEPSIS AND LOW VITAMIN-A RESERVES

The present findings do not provide evidence on the question as to whether the vitamin-A reserves in puerperal sepsis are lower than in the normal puerperal woman. That they are probably lower than those of the average healthy individual appears from a comparison with the figures obtained by Moore in accident cases (Table VI.).

TABLE VI.—*Vitamin-A Content of Liver in Puerperal Women Compared with that of Normal Individual*

No. of cases.	Type of case.	b.u. per g. liver (average).
20	Puerperal sepsis (vitamin-A treatment).	261
13	Puerperal sepsis (no vitamin-A treatment).	122
9	Puerperal disease (non-septic).	203
23	Accidental death.	367

Since going to press data from 8 additional untreated cases have been obtained. These figures are included in Table VI. There were 4 cases of septicæmia which gave values of 10, 79, 13, 42 units per g. liver.

In the present series the average vitamin-A reserves in puerperal sepsis, even after large doses of vitamin A have been given, are seen to be definitely lower than those of presumably normal persons dying as a result of accident. Such a comparison is only suggestive, however, for on theoretical grounds it is likely that the normal liver during the puerperium is not so rich in vitamin A as it was prior to pregnancy. The fœtus must require vitamin A for its development and for building up its own reserves, the amount of which may not be insignificant, for Wolff finds an average of 73 b.u. per g. of liver in 24 new-born infants, and I have found an average of 57 units in 8 new-born infants. Wolff also finds a relatively low vitamin-A reserve in his puerperal cases (7 giving an average of 126 units). He also states that the blood of gravidæ and puerperæ is characterised by a very low amount of vitamin A in the serum.

Comparison of a larger series of septic and non-septic puerperal cases (neither group treated with vitamin A) should throw some light on the relation between low vitamin-A reserves and puerperal sepsis. Such an investigation is in progress.

Discussion

Such vitamin-A values as were found in puerperal sepsis are not in general high when compared with those of men and animals fed on good diets without special supplements of vitamin A. Under these conditions the author has found values ranging from 360 to 1100 b.u. per g. in cattle, from 110 to 700 in rabbits, and up to 14,000 in rats, whilst in man values in the region of 2000 are not uncommon. The liver reserves found under ordinary feeding conditions are far from representing the maximum capacity of the liver to store the vitamin, for in a case of pernicious anæmia in man, treated with liver, 10,500 b.u. per g. were found, whilst in a dog which had received cod-liver oil for several years the vitamin content of the liver rose to 58,000 b.u. per g.

The capacity of the liver to store vitamin A is thus far greater than its normal content on the average dietary of this country. There is at present no evidence that anything short of complete deficiency produces histological changes in the tissues. The findings of Green, Davis, Pindar, and Mellanby [6] in puerperal women do suggest, however, that though the liver may not be devoid of vitamin A the administration of extra amounts of this vitamin may increase the resistance to infection. If, as Wolff finds, the vitamin-A content of the blood is very low in puerperal women, it supports the hypothesis that a certain concentration of the vitamin in the liver is necessary before the blood can take up optimal amounts of vitamin A. A low concentration in the blood may cause weakening of some defensive mechanism against infection. Observations on the blood content of vitamin A in health and disease should throw some light on this point.

Summary

1. The vitamin-A content of the liver has been determined by the antimony trichloride test in 20 cases of puerperal sepsis treated with large doses of vitamin A, and in 14 morbid puerperal cases untreated with the vitamin.

2. A large proportion of the vitamin taken by mouth was not found in the liver, and was apparently rapidly destroyed in the body.

3. Low vitamin-A reserves were found in several cases in spite of intensive treatment. In such cases septic thrombo-phlebitis was a frequent complication.

4. It is suggested that in degenerated conditions of the liver the liver cell is unable to retain the vitamin.

5. In two cases the liver was completely devoid of vitamin, according to the colorimetric test, but there were no clinical signs of vitamin-A deficiency during life.

Grateful acknowledgments are due to Dr. L. Colebrook, Dr. J. Joe, and Dr. F. Kirk for collecting the livers used in this investigation; to Prof. E. Mellanby for advice and criticism; and to Prof. L. K. Wolff and Dr. T. Moore for the privilege of seeing their results before publication.

The work was carried out with a grant from the Medical Research Council.

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TWENTY YEARS' EXPERIENCE OF ARTIFICIAL PNEUMOTHORAX

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TWENTY years ago artificial pneumothorax (A.P.T.) was one of the Cinderellas of therapeutics. Even now the activities that it initiates are not clearly understood—at least not by the writer.

For years we thought it acted entirely by limiting respiratory function, putting the lung out of action as a splint stays the movement of a limb. Then it

was noticed that in one case a small amount of gas injected into the pleural cavity might greatly upset the physiological activity of the lung, whereas the large amount of gas used in another case might seem to have a passive action only, that of mechanical pressure. Later, we began to study and catalogue the so-called accidents, and found that these extraordinary cases threw much light upon the physiological or pathological changes seen in ordinary normal cases. We found that certain changes took place in a small degree in ordinary A.P.T. procedure, but to an extreme degree in cases where a so-called accident happened. It was first evident that pressure therapy was not merely therapy by pressure, but that a physiological reaction followed the induction of A.P.T. in every case.

"ACCIDENTS" OF ARTIFICIAL PNEUMOTHORAX

The well-known accidents met with in the induction of artificial pneumothorax are generally catalogued under the following headings.

1. *Pleural or pleuro-cardial reflex.*—A condition of shock, being a sequence of cause and effect. (In these cases the effect is altogether out of proportion to the apparent cause.) In all cases of so-called pleural reflex there is an immediate upset in the physiological processes in the lung as a tissue, together with the production of a disorder in the rhythm of respiration in the lung as an organ. There may be an extreme nervous collapse and a sudden cardiac irregularity. Pain may be present, but pulmonary œdema is always produced.

2. *Gas embolism* was described in graphic phrase by C. Saugman at the International Congress of Medicine in London in 1913. Saugman pushed his needle rather deep into the chest and the patient instantly died. Post mortem, Saugman found rupture of a bronchus and the vessel lying beside it, and gas bubbles in the vessels of the brain. In J. Crocket's published case death was not quite as sudden, and was due, he thought, to an unfortunate "milking" of the tube of the apparatus by an assistant, which forced gas into the chest before the needle-point was free in the pleural cavity. In all such cases there is shock, and in most of the German cases published it is difficult to decide whether death was due to shock or to embolism.

3. *Dislocation of the mediastinum* follows the induction of too large a quantity of gas into the pleural cavity, thus producing an immediate dextra- or sinstra-cardia. Parry Morgan considers that puncture of the lung may cause a leakage of gas and add to the volume forced in from the gas cylinder. In such cases the compression of one lung may also compress the other lung and lessen the negative pull in that lung. The result of so interfering with the negative pressure, which is physiologically necessary, can be easily appreciated.

4. *Pulmonary œdema or congestion* occurs in all other accidents, but is mentioned separately because it often develops without any apparent sufficient cause, the lung being a vital organ and not a mechanical machine.

In the following examples, collected from a practice extending over 20 years, extraordinary cases are stressed because of the lessons they teach. Ordinary cases require less comment, but I am convinced that in all ordinary cases there is some upset in the lung tissues, and that the actions and interactions which follow are the main cause of improvement.

CASE RECORDS

CASE 1.—A girl of 19 years. Fragile in build, fine features. Mucous membranes pale and teeth small, in regular setting and free from decay; no enlargement of tonsils or glands of neck; hands long and thin; muscles small; joints capable of hyper-extension; hair abundant, lanular hair on forehead. Signs of activity both apices, but area of disease apparently limited. T.B. present in sputum. Heart small. Pulse quick. Night temperature above 100° F.

It was considered, after X ray and other examinations, that gross disease was limited in area but that there was miliary spread. It was decided to try A.P.T. for the right (the worse) lung. The result at first was good; symptoms and signs decreased and the general condition improved. The improvement was, however, transitory, and the treatment was discontinued for a time. When we tried later again to inflate the pleura, adhesions had formed, produced by the treatment, and we could no longer get gas into the pleura.

To-day we should treat such a case with gold, and if by A.P.T. we should use very small amounts of gas. This was a case of acute adolescent tuberculosis. The type has been previously described by me in THE LANCET (1910, ii., 1028).

CASE 2.—A woman of 35 with gross disease in both lungs. T.B. +. Febrile. Occasional attacks of auricular fibrillation. As this case was hopeless without treatment, it could not suffer from treatment. A.P.T. attempted on the right side. Very few adhesions found. Inflation was easy. Patient bore the treatment well. Symptoms declined and there was great improvement for 18 months. Patient got up and was able to take long walks. Then relapse and death.

Autopsy showed right lung completely collapsed. A small amount of pus and oil (she had had oleothorax as well as A.P.T.) found in right chest. Left lung grossly diseased.

Large inflations of gas had been used. This was one of my early cases (1914). If I attempted to treat such a case now I should use smaller inflations, should not attempt collapse, and should rely upon oleothorax rather than A.P.T. Phrenic avulsion might also have helped. Gold never does any good in such advanced cases.

CASE 3.—A case similar to the last but with more adhesions. As the needle was pushed in and before the gas taps were opened the patient complained of feeling "queer." No inflation was attempted. The operation was at once stopped. The patient did not complain of any abnormal feeling after she went to bed, but next day it was found that she had hemiplegia, which became more pronounced during the next few days. She died within a week.

No autopsy was allowed, but this was evidently a case of embolism, probably gas embolism, though from the tardy exhibition of symptoms of paralysis it was thought we might have mobilised a thrombus. Although the gas taps were not opened the tubes contained air, and this may have been aspirated into a punctured vessel.

CASE 4.—A man of sturdy build and an ex-soldier. Marked lung signs. A large cavity in each upper lobe. Symptoms few. Afebrile. Patient, whilst doing light work in the sanatorium garden, had a hæmoptysis. He was sent to bed and in ten days vomited 3 pints 8 ounces of blood (measured). A.P.T. seemed inadvisable in view of the bilateral signs, but as death seemed inevitable it was tried on the right (the worse) lung. The treatment was successful. Hæmoptysis stopped and the patient slowly gathered strength. A.P.T. was not continued. Six months later it was decided again to try A.P.T. systematically. As the needle entered the chest, patient said "I feel queer." He became unconscious and convulsed, his cardiac rate sank to 40, and respirations quickened. Auscultation showed the presence of acute œdema; Babinski's sign was + on both sides, more marked on one side than the other. Vigorous treatment, including artificial respiration, oxygen, and pituitrin, brought him round. A week later another attempt was made, and A.P.T. was induced very easily. Great general improvement followed (patient able to get about) until the other cavity began to enlarge and he died. It seemed from the autopsy that we might have attempted to limit or suppress the cavity on the left side.

This was an extreme case of pleural reflex; although from the symptoms during the attack it was impossible

to exclude gas embolism, it should be noted that there was no subsequent paralysis.

CASE 5.—Similar physical signs to above. The right lung grossly affected, the left lung slightly affected. At the consultation we decided to attack the left lung because the disease in the left lung seemed active. A.P.T. was induced on the left. A fatal hæmoptysis occurred two days later, and we judged that this came from the more grossly diseased lung, and we also thought that interference with the left lung had caused the catastrophe in the right.

CASE 6.—A flying officer with apparently unilateral disease had a history of recurrent hæmoptysis. A large inflation produced considerable dyspnœa and cyanosis. All this quietened down and the patient seemed in good condition and ready in a week for another inflation. In principle the patient agreed to the repetition but delayed the act. In five weeks, a day before the A.P.T. was to be repeated, the patient had a fatal hæmoptysis.

CASE 7.—The patient had been known to me as one suffering from pulmonary tuberculosis for many years. A rather sudden onset of acute broncho-pneumonia sent him into hospital. He seemed in a most critical condition. High febrility. Rapid pulse. Some but not extreme dyspnœa. Slight cyanosis. Sputum excessive. Disease bilateral. T.B. ++. A.P.T. was induced in the worse lung with remarkable success. Patient was walking about in a month's time. This was in 1914, soon after I had introduced oleothorax to the profession as a new method of treatment. Oleothorax was used as well as A.P.T., a pint of oil being injected into the pleura.

The case was published in the *Edinburgh Medical Journal* (November, 1915), where fuller details are to be found. The patient died some years later from hæmoptysis.

CASE 8.—An army officer with a history of chronic pulmonary tuberculosis had an acute attack of broncho-pneumonia, somewhat similar to the last-mentioned case. He was treated in the same way and with the same success. Then an interlobar empyema developed and was treated by aspiration and oleothorax. Patient gained several stones in weight and was able to carry on an exacting employment, his main trouble being dyspnœa on exertion. He was subject to relapses, always associated with broncho-pneumonia, generally relieved by deep aspiration of pus. The question of phrenic avulsion and thoracoplasty was raised, and eventually phrenic avulsion was adopted with considerable success.

One can never tell when one has finished with such a case, and the fear of hæmoptysis is ever present.

CASE 9.—Very similar to the above. This patient, a man in easy circumstances, was treated by A.P.T. in 1913. Eighteen inductions were carried out. For ten years he remained in comparatively good health and able to manage his business. Then hæmoptysis. The disease was then in a fibrotic stage with dense adhesions on the left (the worse) side. A.P.T. and oleothorax carried out with difficulty owing to adhesions. Thoracoplasty advised by Dr. Vera Pearson, to whom I sent him. The patient, however, began to improve again, and I negatived thoracoplasty and advised phrenic avulsion. The patient was against additional procedure as he felt comparatively well. Acute fatal hæmoptysis occurred 15 years after the commencement of treatment.

CASE 10.—A patient, 16 years of age, with chronic bronchiectasis and massive fibrosis almost confined to the left lung. Very ill—sub-febrile, emaciated. Sputum very offensive. Hæmoptysis not great but recurrent. Thoracoplasty advised but rejected. A.P.T. and oleothorax attempted, and although there were many adhesions and complete compression was of course out of the question, several considerable inflations, followed by injections of oil in large quantities, produced a very remarkable result. Patient was kept under close observation and was subjected to small inflations about every three months. The treatment was then empirical rather than logical. The patient is now able to work; I am certain there is a danger of relapse.

Since this paper was written the relapse has come.

CASES 11 and 12.—Two similar cases, middle-aged men, with chronic fibrosis and bronchitis, sputum excessive. Basal bronchiectasis, chiefly on one side. T.B. were found in one, but not in the other.

Treated with oleothorax with great temporary benefit. (I always give A.P.T. first before injecting the oil.) Oleothorax most valuable in such chronic cases after A.P.T. has done its partial compression. (See report of International Congress of Medicine, 1913, in which oleothorax was suggested and two cases described—the first, I think, in modern medicine.) I think it is of value as an alternative to the more drastic thoracoplasty. In one patient acute pulmonary œdema followed the introducing of the needle and frightened me into not attempting further treatment, but in most cases the patient bears the treatment well.

Dr. N. Tattersall has recently told me of a case in which a successful pneumothorax was gradually becoming obliterated by pleural creep. He filled up the pleural cavity with gomenolised oil (1½ pints), and the patient remained in excellent health for 18 months. She then developed pneumonia, followed by an empyema on the treated side, which ruptured into the lung, and pus and oil were being coughed up before the presence of the empyema had been suspected. All the pus and oil have now been aspirated, and the case is improving on pleural lavage with 1 in 2000 acriflavine. Thoracoplasty will probably be required in this case to close the cavity, as the lung is tightly bound down by thick visceral pleura.

CASE 13.—Patient with acute lobar pneumonia which began in hospital where he was being treated with A.P.T. The A.P.T. was discontinued as it increased the dyspnœa and cyanosis.

CASE 14.—Patient with acute lobar pneumonia with hæmoptysis and T.B. negative. A.P.T. was done to check the considerable amount of bleeding. The treatment stopped the hæmoptysis and aborted the pneumonia. After the induction the patient, feeling comparatively well, went home. Relapse; death from pneumonia.

CASE 15.—A patient whose case was diagnosed by his doctor as one of pneumonic phthisis with T.B. in sputum, was removed by me to hospital and treated with A.P.T.

This was a case of acute lobar pneumonia, and I recognised that I had made a mistake in diagnosis. The T.B. in the sputum must have been from a small lesion and was independent of the acute illness from which the patient had suffered.

Several French writers have been impressed by the occurrence of broncho-pneumonia, together with tubercle, in patients admitted to hospital. They have found that rest in bed is generally the best method of treatment. I have read with great interest the cases of acute lobar pneumonia treated by A.P.T. (J. J. Coghlan, THE LANCET, 1932, i., 13).

CASE 16.—A patient, apparently suffering from unilateral pulmonary tuberculosis, was treated by A.P.T. Whilst undergoing treatment she began to have diarrhœa which could not be permanently arrested, though Dr. A. F. Hurst's extreme acid treatment was tried. The question arose whether or no the A.P.T. had stimulated the intestinal disease, hitherto latent. This gastro-intestinal disturbance, whether produced by treatment or independent of treatment, is a great bar to further treatment by A.P.T. In one case, a non-tuberculous abscess of the lung, persistent and distressing vomiting for some time followed a few inductions.

FIBROSIS

All our methods of treatment induce fibrosis, and this of course has its attendant dangers. Patients with fibrosis and intermittent dyspnœa, generally spoken of under the heading of asthma, should be left alone unless other conditions demand treatment. A.P.T., by inducing pulmonary œdema, may precipitate an "asthmatic attack." I have seen fibrosis in the lung apparently induce a similar condition outside the lung. In one case there was stiffness of the muscles of the neck simulating spinal disease, though careful examination and observation (X ray included) did not indicate any bone disease. Marked emphysema is always a contra-indication to A.P.T., especially in the middle-aged patient. I have seen many examples where the gas has been introduced into the

pleura in too large a quantity, causing extreme distress, and danger has followed from dislocation of the mediastinum. Here it is necessary to deflate at once.

Spontaneous pneumothorax, not tuberculous in origin, is no uncommon occurrence. One patient, who was sent to me by Dr. Durward Brown, of Harrogate, whilst playing tennis felt a sudden pain in the side, and X rays showed complete compression of one lung by gas. Such cases often do well without interference, but the prognosis is very different when the patient has a gross tuberculous lesion. In these cases deflation may be instantly called for.

Fibrosis following A.P.T. affects both healthy and diseased lung tissues. Pleuro-pericardial adhesions are common. When disease is in both lungs and treatment is attempted on both sides, the amount of gas used on the second side should always be limited to that quantity which will limit disease activity. One's object is to stimulate sufficient but limit excess of fibrosis.

OTHER CONDITIONS

When classifying the type of cases sent to hospital for A.P.T., one notes the absence of patients suffering from a combined infection of joint and lung disease, whilst tubercle of the testes and of the ovary has appeared quite frequently associated with cavities in the lung.

AN ALLERGIC SKIN REACTION AFTER SCARLET FEVER

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THE possible appearance of a condition of allergy or hypersensitiveness to the intracellular products of hæmolytic streptococci has recently been suggested by a number of workers. Mackenzie and Hanger,[1] using filtrates and nucleoprotein extracts from a number of pathogenic organisms, including the hæmolytic streptococcus, carried out intradermal tests on healthy individuals and patients suffering from a variety of diseases. They suggested that a proportion of adults are allergic to products of one or more organisms, but were unable to correlate the results of the skin reactions with pre-existing infections in the subjects tested. Irvine-Jones [2] found that a high proportion of rheumatic cases gave a positive skin reaction to filtrates of four-day cultures of streptococci of all types. It should be noted that a filtrate of a culture incubated for such a period includes both diffusible exotoxin and the products of autolysis. The significance of skin reactions to a composite reagent of this nature is therefore difficult to interpret. Recently Coburn [3] has shown that patients suffering from acute rheumatism are often hypersensitive to nucleoproteins derived from the bodies of hæmolytic streptococci which have been freed from all extracellular toxic material. Collis,[4] observing a close association between throat infection with hæmolytic streptococci and cardiac relapse in children convalescent from acute rheumatism, was able to demonstrate a high degree of cutaneous hypersensitiveness to proteins of this organism in rheumatic cases.

The skin reaction which Coburn and Collis described was of the papular type, quite unlike the flat reaction of the Dick test. They have suggested that the rheumatic state results from a number of predisposing causes of which not the least important is an allergy to products liberated from foci of infection with hæmolytic streptococci.

The possibility of applying a skin test clinically to determine whether this factor is present in doubtful rheumatic cases is of special interest, and the present work was undertaken to discover whether a known streptococcal infection produced such an allergic state. Dick toxin and preparations containing the soluble intracellular products of two strains of hæmolytic streptococci have been used as reagents for carrying out intradermal tests on children suffering from scarlet fever. Each child was inoculated with the three test substances on admission to hospital and at weekly intervals throughout the illness.

METHODS

The Dick toxin used was the standard product issued by Burroughs Wellcome, Limited.

Extracts of streptococci were prepared as follows: The strains used were (1) S.S.1, a standard laboratory culture of a hæmolytic streptococcus originally isolated from a case of scarlatina and known to produce a potent Dick toxin; (2) N.S., a strain recently isolated from the throat of a child suffering from subacute rheumatism. This strain was chosen at random as being one from a non-scarlatinal source. The 24-hour growth from 100 c.cm. of phosphate broth (containing 0·2 per cent. glucose) was removed by centrifuging and washed twice in sterile normal saline. The sediment from the second washing was then transferred to a bacteriological ball-mill, dried and ground. The resulting powder, taken up in 10 c.cm. of sterile saline and centrifuged to remove bacterial debris, was the crude extract used in the tests. It is to be noted that no chemical treatment of the organisms was applied in its preparation. The dilution for skin testing was 1 : 100, which had been found by preliminary tests to be capable of producing distinct reactions without any evidence of primary toxicity such as might give "false positives."

All tests were intradermal in the volar aspect of the forearm, 0·2 c.cm. of the material being injected. Readings were made at 24, 36, and 48 hours. (The skin reactions to the bacterial extracts were found to be maximal after 36 hours.)

RESULTS

Twenty-eight cases were examined throughout the course of the disease and during convalescence. They could be divided into two groups according to the results, viz. :—

Group I (22 cases).—Those developing an allergic reaction which appeared during the second, third, or fourth week.

Group II (6 cases).—Those in which no allergic reaction was obtained or in which the reaction, if present on admission, did not show an increase after the disease.

The allergic reaction which developed was identical with that described by Mackenzie and Hanger, Coburn, and Collis.

Within 12 hours of injection of the diluted extract an area of redness appeared which increased in intensity to reach a maximum after 36 hours. The fully developed reaction consisted of a central dark red swollen area which attained in some cases a diameter of 20 mm. Surrounding this was a variable zone of erythema, paler in colour and usually clearly defined in its margin from the surrounding skin. In the stronger reactions a definite zone of pallor surrounded the whole area. In other cases this was absent and the margin faded imperceptibly into the unaffected skin. In the more marked reactions the centre of the inner œdematous zone was pale and almost necrotic in appearance, though the skin never broke down. Slight pain was occasioned on movement of the arm, and tenderness was a feature of all moderate and severe reactions. Fading was rapid after 36–48 hours, the peripheral zone disappearing

* In receipt of a part-time grant from the Medical Research Council.

within 12 hours, though traces of the inner papular lesion remained for some days. The allergic reaction thus differed from the Dick reaction in its rather later development after injection and in the presence of the swollen and tender dark red central area.

The group of cases developing such an allergic reaction could be subdivided by reference to the results of the Dick test (see Table I.). In 14 cases the Dick reaction showed the usual change from positive to negative. In 6 cases the initial Dick test was negative, though the clinical condition on admission and the subsequent course of the disease showed it to be true scarlet fever. In 2 cases the Dick test remained positive throughout. Table II. illustrates the actual readings made on a case in the group showing an initial positive Dick reaction with the late development of a reaction to the bacterial extract. The difference in degree of reaction with strain S.S.1 and strain N.S. respectively was noted throughout. The strain S.S.1 was the scarlatinal strain which had been maintained in culture for many years. When a freshly isolated scarlatinal strain (S.2) was substituted for S.S.1 the reactions were exactly equal to those obtained with strain N.S. (see Table III.). It may be that the hæmolytic streptococcus loses to some extent the reacting principle after prolonged artificial culture.

TABLE I

Twenty-two cases of scarlet fever showing development of allergy to streptococcus extract, grouped according to results of Dick tests.

Dick test.		Allergic reaction.		Cases.
On admission.	On discharge.	On admission.	On discharge.	
Positive.	Negative.	Negative.	Positive.	14
Negative.	„	„	„	6
Positive.	Positive.	„	„	2

TABLE II

Example of results obtained in skin tests on an adult, aged 24, during scarlet fever.

Reagent used in skin test.	Weeks—			
	First.	Second.	Third.	Fourth.
Dick toxin	24×18	Nil.	Nil.	Nil.
"Dick control" ..	Nil.	„	„	„
Extract S.S.1	„	„	5×5	10×12
„ N.S.	„	„	10×10	35×15

S.S.1 = Scarlatinal strain of hæmolytic streptococcus. N.S. = Hæmolytic streptococcus from source other than scarlet fever.

In this and the subsequent table the figures indicate diameters of skin reactions in mm.

TABLE III

Parallel tests using extracts of strains S.2 and N.S. Diameters of reactions obtained in convalescent scarlet fever cases.

Reagent used in skin test.	Cases—				
	1.	2.	3.	4.	5.
Extract S.2 ..	35×24	30×20	35×28	45×35	33×22
„ N.S...	38×24	30×20	34×28	42×30	32×22

Cases not developing an allergic reaction.—These cases numbered 6 of the 28 investigated. In 1 the reaction to streptococcus extracts was negative throughout. In the other 5 cases a faint reaction was noted during the first week, and this persisted throughout, with no tendency to increase.

Influence of age on the reaction.—The number of cases examined is too small to provide adequate data from which to draw any conclusions as to the influence of age in the development of the allergic reaction. The ages varied from 1½ years to 24 years. It is noteworthy that all cases over the age of 7 years developed marked allergy. These numbered 13. Of the 15 cases of 7 years and under, 9 developed the allergic reaction and 6 did not.

This finding is of interest, since Mackenzie and Hanger [1] showed that in unselected normal children and adults the proportion of reactors to bacterial extracts of various bacteria increased with age, as also did the severity of the lesions produced. It is very uncommon to meet with a pseudo-reaction in the Schick test during childhood, but towards adolescence these reactions become more frequent. This is probably another example of the same phenomenon.

DISCUSSION

It appears from these results that in a proportion of cases infection with the hæmolytic streptococcus is capable of producing a condition of hypersensitiveness to intracellular products of this organism. This finding would bring streptococcal disease into line with a number of infections known to result in allergy to the specific antigen.

It might be objected, however, that these reactions were a manifestation of a pre-existing allergic state suppressed during the febrile stage of the illness and reappearing in convalescence. It must, of course, be noted that a similar reaction can be elicited in apparently normal persons who have not previously suffered from a recognisable streptococcal infection. Such reactions, however, occur in a minority of urban children during the age-period 6–15 years. This had been shown by Coburn in New York, Collis in London, and H. J. Gibson and D. Stewart (unpublished observations) in Edinburgh, where 35 per cent. of normal children have been found to react. The disappearance of such allergic reactions during periods of fever or extreme weakness from any cause has been reported by certain observers, this inhibition being quite non-specific (see Mackenzie and Hanger [1]).

The fact that in our work 75 per cent. of the cases and all over the age of 7 became hypersensitive in convalescence suggests that the positive skin reactions were directly due to the infection and did not result merely from a recrudescence of a temporarily suppressed reactive state. It should be noted that all cases with sharp pyrexia or evidence of marked toxæmia were excluded from our series owing to the routine administration of antitoxin. Thus only mild cases were investigated. It does not seem probable that such cases with only slight and transient systemic disturbance would lose their skin reactivity. Finally, as showing that fever does not necessarily inhibit the reaction, may be mentioned a case of scarlatinal arthritis in the third week of the disease with a temperature of 101·6° F. in which a lesion of diameter 75 × 35 mm. was produced. The evidence seems to suggest that the allergic condition, as shown by the cutaneous reaction during convalescence, had arisen de novo and had not existed in the patients before the disease commenced.

We do not propose to discuss at length the mechanism of these reactions. The work of Zinsser and his co-workers [5 6] has shown that this "allergy of infection" is fundamentally different from

anaphylaxis. An anaphylactic state associated with circulating antibodies and passively transferable to another animal may be induced by injection of bacterial proteins, as with almost any other protein, but this state is not comparable with the allergy resulting from infection with the same organism. These observers have contrasted the hypersensitiveness following "injection" with that resulting from "infection."

Dochez and Stevens,[7] in work on the induction of a "Dick-positive" state in animals, showed that two phases could be demonstrated. In the early stages of sensitisation, filtrates of hæmolytic streptococci produced a "flat" type of erythematous reaction, and this effect could be readily neutralised with a specific antiserum. No reaction followed injection of heated filtrate at this stage. Later the reaction was papular in type and no neutralisation with any serum was possible while the reacting substance in the filtrate was thermostable. It was also noted that the late papular type of reaction was less specific than the early one, equally good results being obtained with strains of hæmolytic streptococci from sources other than scarlet fever. In scarlet fever the Dick reaction has been thought to correspond with the first phase. The present work shows that while both the "Dick-positive" phase and the allergic phase are found at different times in the course of scarlet fever, the reagents necessary to elicit the reactions differ. The early flat reaction is produced by the diffusible products of the organism, as found in filtrates of young fluid cultures, while the later papular lesion is a response to material from the bacterial bodies freed from extracellular toxins.

The clinical significance of the development of this highly allergic state in the late stages of scarlet fever is difficult to assess. The products of the organism are apparently toxic to the skin of such an individual, in the same way as tuberculin is toxic to a tuberculous person. If, therefore, a persistent focus of infection were present in the throat in the later stages, reactive products might be liberated into the blood stream and produce late toxic effects. It may be that this process is concerned in the production of rheumatism and nephritis complicating scarlet fever, since these conditions frequently appear after the early toxic phase, as manifested by fever and rash, has subsided.

The results reported here have no direct bearing on the ætiology of acute rheumatism. Of many who acquire the specific hypersensitiveness as a result of scarlatina, few subsequently show evidence of the rheumatic syndrome. All that can be said in this connexion is that the papular reaction of allergic type following intradermal injection of products of a hæmolytic streptococcus cannot be regarded as specific for acute rheumatism. The question of the persistence of the allergic state is of obvious importance and requires further investigation.

SUMMARY

1. In a series of cases of scarlet fever weekly intracutaneous tests have been carried out with an extract prepared from cultures of hæmolytic streptococci representing the soluble intracellular products of the organisms freed from diffusible substances. The extract was diluted 1 : 100 for the test.

2. Twenty-eight cases were examined and in 22 the reaction, negative during the first week, developed and became strongly positive by the fourth week.

3. All cases over 7 years of age acquired the allergic reaction.

4. The possible fallacy, that the reaction noted in convalescence is simply a recrudescence of a pre-existing skin-sensitiveness temporarily inhibited during the fever, is discussed.

We wish to acknowledge the kindness of Dr. W. T. Benson in giving us access to his cases. We are also indebted to Prof. T. J. Mackie for his advice and help throughout the work.

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AN AID IN THE TREATMENT OF TOXÆMIA OF PREGNANCY

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DURING 1929 over 600 women in Great Britain died from eclampsia, and it is therefore probable that each year several thousand—who have had toxæmia without reaching a convulsive stage—suffer from prolonged ill-health, or are doomed to premature death, in consequence of the damage sustained by the kidneys with or without hepatic involvement. Dr. H. Thomson and myself, from observations made at the County of Lanark Hospital, Bellshill, and at the Royal Maternity Hospital, Glasgow, are convinced that this need no longer be so if the simple line of treatment recommended by us be adopted.

We are of opinion that calcium is the main custodian of hepatic efficiency during pregnancy, and also that the calcium content of the blood is low at that time and especially during the pre-eclamptic state. We also believe that there is an accompanying deficiency of alkali. Hence, for over a year and a half all cases of albuminuria of pregnancy in the outdoor and indoor departments of the Maternity Hospital at Bellshill have been treated with calcium, potassium citrate, and sodium bicarbonate, and the results have been so favourable that we consider a great advance has been made.

A. A. Osman and H. G. Close [1] in 1931 demonstrated in normal pregnancy that there is a decrease in the plasma bicarbonate, and that this state persists throughout gestation. On the other hand the water content of the blood and tissues is increased and becomes greater as the plasma bicarbonate diminishes. By treating cases of albuminuria of pregnancy with alkalis they found that the amount of albumin in the urine became less, although the œdema occasionally increased after the initial dose. Potassium citrate and sodium bicarbonate, grs. 50 of each, were given in 1½ oz. of water several times a day and the fluid was restricted to 4 pints in the 24 hours. Each day the dosage was increased. The patients were kept in bed and a full diet was allowed.

We are strongly of opinion that such cases should be treated with calcium as well as alkalis, and also that the maximum effect of the calcium is obtained

[1] Proc. Roy. Soc. Med., 1931, xxiv. (Sect. Obst. and Gyn.), 40.

when given in combination with the alkalis. At the Maternity Hospital, Bellshill, over 400 cases of albuminuria of pregnancy have been treated in the indoor and dispensary departments since the closing months of 1930 with a mixture of calcium sodium lactate (grs. 7½), potassium citrate (grs. 40), and sodium bicarbonate (grs. 20). For ease of administration these medicaments are prepared by Parke, Davis and Co. for us in tablet form with a flavouring agent, and three or four tablets a day are prescribed. These tablets are very soluble. It is interesting to observe the fall which has taken place in the number of cases of eclampsia admitted to this hospital since this special treatment was instituted.

Year.	Cases.	Year.	Cases.
1926	27	1930	38
1927	19	1931	8
1928	24	1932	7
1929	22		

It is important to note that this treatment was started towards the close of 1930, and that all the cases admitted during 1931 and a part of 1932 had never been to one of the antenatal centres and had not received the special treatment. Therefore the women who were under treatment by calcium and the alkalis were immune to this complication of pregnancy. The treatment cannot be expected to cure cases which are suffering from a chronic renal lesion, for the kidney is already permanently damaged and lacks the pronounced permeability of the kidney during normal pregnancy or the pre-eclamptic state. For this reason this special treatment is contra-indicated in cases of chronic renal disease, since alkalosis may supervene, but we imagine that this risk has been exaggerated. In the pre-eclamptic state with abundant albumin in the urine we always administer the drugs intravenously as soon as the case comes under observation. For this purpose the sterile solution of calcium gluconate (Sandoz) is used by us. Each ampoule contains 10 c.cm. of the solution, and the contents of one ampoule is mixed with sterilised potassium citrate and sodium bicarbonate in about a pint of boiled water.

A sterile solution of potassium citrate and potassium bicarbonate can be obtained in ampoules from some of the large chemical manufacturers, and in hospital we keep the calcium and alkali solutions in separate ampoules so that pre-eclamptic cases can receive immediate treatment. Apparently potassium bicarbonate can be rendered sterile by repeatedly heating it to a temperature of 150° F. without disintegrating, but when we made our own preparations we mixed the calcium and alkaline solutions in the cold state before bringing them to blood heat for intravenous injection. We consider that by so doing the various ingredients are more likely to retain their individuality, although from a practical point of view this may be relatively unimportant as probably all that is necessary is to provide an alkaline medium wherein the calcium can exercise its function to the best advantage. Sometimes we inject the alkalis first and later the sterile calcium solution. The effect of intravenous medication in many instances is dramatic, and quotation of a case treated by us will serve as an example of what may occur.

A primigravida was admitted with œdema so extreme that the eyes were practically hidden, there was severe headache, and high blood pressure. The output of urine was small and it boiled so solid that in order to estimate the albumin present the urine had to be diluted. The reading was then found to be 17, and after intravenous injection it dropped in 24 hours to 6 and on the following day to 0·5. The œdema rapidly disappeared, the blood pressure fell, and the quantity of urine secreted quickly increased, and within a few days the patient, who was admitted in a pronounced state of toxæmia, was happy and comfortable.

After injection four tablets a day are taken orally by the patient, but the intravenous administrations should be repeated if the albumin begins to increase in amount and the blood pressure rises. A temporary but pronounced improvement may be expected, but if any anxiety exists labour should be induced, and this can be done with comparative safety as the patient is no longer being overwhelmed by the murky waters of the pre-eclamptic state. If the calcium and alkali treatment were omitted many of these patients would probably develop convulsions during induction of labour.

The public health authorities of Glasgow and the County of Lanark are now using this form of treatment in all their antenatal centres and we advise that the administration of these drugs should be started about the fourth month of pregnancy. Not only may toxæmia be thus prevented, but the alkalinity of the urine which is produced may have an inhibitory influence on the activities of the *Bacillus coli communis* and diminish the incidence of pyelitis. Recently it has come to my knowledge that one of my colleagues at the Western Infirmary, Glasgow (Dr. J. A. W. McCluskie), always gives intravenous injection of calcium before using salvarsan in cases of syphilis, for as he finds it is a reliable preventive of acute yellow atrophy of the liver—a complication which is liable to arise if salvarsan alone be used. This circumstance is additional confirmation of the protective action of calcium in connexion with hepatic metabolism. We have obtained less satisfactory results in the pre-eclamptic state from the intramuscular injection of calcium and consequently we recommend intravenous administration.

SOME POINTS IN THE DIAGNOSIS AND TREATMENT OF THE ACUTE RETROPHARYNGEAL ABSCESS

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An acute retropharyngeal abscess presents behind the posterior pharyngeal wall, medial and posterior to the posterior faucial pillar, in the potential space between the prevertebral fascia and the fascia investing the pharynx. This chink extends laterally behind the carotid sheath and passes under the sternomastoid muscle towards its posterior border. It contains loose tissue which enables the pharyngeal wall to be raised easily and to a great extent away from the posterior vertebral support by any collection of pus.

For examination of the throat the patient faces directly forwards. If the head is deviated to one side, the transverse process of the upper cervical vertebra forms a prominence behind the posterior pillar, and so simulates a retropharyngeal abscess. This prominence may be very striking.

The abscess may thrust forward the posterior pillar and, where the tonsils have been previously removed, this bulge may simulate an inflamed tonsil. As the anterior faucial pillar invariably atrophies after tonsillectomy, the bulge described is, to the non-discriminating observer, behind a pillar (mistaken for the anterior pillar) and the resemblance may be

more than a superficial one (cf. Case 2). The abscess may extend up behind the soft palate, and down as far as the post-laryngeal region. It may coexist with a cervical swelling—i.e., apparent cervical adenitis. Hence, where an adenitis is present in the upper cervical region, the retropharyngeal region should be examined for any signs of an abscess there (Case 1).

The diagnosis is completed by palpation. The moistened finger is gently inserted into the pharynx and the swelling palpated. Fluctuation may be detected bimanually with any coexisting mass in the neck. The mass may be hard and yet pus be present. In such a case it is prudent to aspirate the retropharyngeal swelling through the mouth with a thick-bore needle and syringe. In adults, a cocaine and adrenaline spray to the throat is sufficient anæsthetic. The hawking produced by introducing the needle into the tumour will often force pus into the syringe, without the aid of suction (Case 4). Occasionally a diagnosis of retropharyngeal abscess may be made in infants with the direct laryngoscope (Case 6). When persistent inflammatory signs and symptoms occur after operation for tonsils and adenoids, a retropharyngeal abscess must be borne in mind as a possible complication (Case 3).

ANTERIOR AND POSTERIOR QUINSY

Just as pus, collecting between the tonsil capsule and the anterior pillar, produces a quinsy—i.e., an anterior quinsy, which pushes the tonsil posteriorly—so pus may form towards the posterior aspect of the tonsil, pushing it forwards and producing a "posterior" quinsy. This collection is between the mucous membrane of the posterior pillar and that of the posterior pharyngeal wall, and inside the pharyngeal fibrous layer. It simulates a retropharyngeal abscess but is not so deeply situated and, of course, does not extend laterally into the cervical fascial planes. Case 5 is an example of confusion in diagnosis. Only when the pus is absolutely submucous, as detected on exploration, can the diagnosis of a posterior quinsy be made with certainty.

DRAINAGE OF AN ABSCESS

In big children or adults a general anæsthetic is advisable. Young children and infants require no anæsthetic. The child is immobilised by wrapping it in a blanket which pinions the arms to the side. The head is held by an assistant and extended over a sandbag under the shoulders. The Davis tonsil gag is introduced. The surgeon, using a head-lamp, is seated at the head of the table. A moistened captive gauze swab is packed into the nasopharynx. The mucous membrane is incised by making a longitudinal tear, with the points of a closed, long, single-toothed dissecting forceps, over the most prominent part of the swelling, just medial to the posterior pillar and (usually) half-way between the soft palate and the base of the tongue, in the operative field. The initial tear is about half an inch long. It is deepened by successive strokes until a dense whitish capsule, resembling the capsule of the tonsil, comes into view. This layer must be penetrated before pus is liberated. It is the fibrous investment of the pharynx surrounding its musculature.

A retropharyngeal abscess may arise ab initio in the retropharyngeal space and remain localised there without any external cervical manifestation of its presence (Case 2); or it may extend laterally to appear as a swelling at the angle of the jaw, under cover of the sternomastoid; or it may commence as a cervical adenitis and then extend medially behind the pharynx to appear there as a retropharyngeal abscess, in which case the collection may be adequately drained through a retropharyngeal incision (Case 1). The extension passes deep to the carotid sheath, and the points of the forceps may be plunged posterolaterally without endangering the vessels. The inexperienced may be hesitant about penetrating further, as the white capsule may be at some depth from the surface. In any case of real doubt the swelling should be aspirated with the needle and syringe, when the withdrawal of pus will embolden the operator to proceed with the exposure of the abscess. Pus is liberated as soon as this "capsular" stratum is traversed. The use of an automatic sucker is advised, if one is available. In any case, the pus is mopped away, and the original opening is made as long as possible by running the points of the forceps up and down so as to tear open the tissues covering the abscess in its entire length. This may extend from well above the soft palate to the arytenoids. A gloved finger is introduced into the abscess cavity to determine its extent, and a bimanual examination is made with a finger over the neck. Pressure on any cervical mass will empty its part of the abscess into the wound. No bare bone is palpable, and the finger will break down any adhesions or loculi in the cavity.

The liberated pus, often considerable in amount, is prevented from entering the trachea by the posture and the use of the Davis gag; and it is prevented from entering the nasopharynx by the preliminary plug in the post-nasal space. The bleeding usually ceases rapidly. The cavity and throat are mopped dry, the plug is removed, and the patient is put to bed, lying on the face as after a tonsil and adenoid operation. With this wide exposure, pocketing of pus is prevented and a second operation obviated.

CASE 1. *Retropharyngeal abscess, with swelling in the neck, receding on retropharyngeal drainage.*—A child, aged 6, had tonsillitis with cervical adenitis. The illness commenced with a temperature and epistaxis, for which no cause was obvious. The pyrexia persisted, and on the tenth day the adenitis was still present. The glands were hard, and no trace of fluctuation or softening could be detected. There was now visible a painless fullness behind the right posterior pillar, detectable as a vertical band. Under anæsthesia, as described above, the retropharyngeal mass was explored with forceps. The pus was evacuated and the prominent cervical swelling collapsed completely. An external incision was avoided, a point of some importance when the patient is a girl. A month later there was no trace of cervical adenitis. The throat was normal and the tonsils small.

CASE 2. *Retropharyngeal abscess, simulating an acute aural condition.*—A girl, aged 9, whose tonsils had been removed by me three years before, had an acute febrile illness, with a temperature up to 104° and with mild bilateral cervical adenitis at the angle of the jaw. The swellings subsided, but there was severe pain in the left ear and dysphagia. A rigor occurred. I saw the child on the third day of the ear symptoms. There was tenderness over the mastoid, exquisite at the angle of the jaw. There was no cervical swelling. The tympanic membrane was normal. Behind the posterior pillar was a red swelling, tender to palpation, pushing it forwards to form a bulge behind it. The abscess subsequently burst. It resembled an inflamed tonsil, inasmuch as it formed a bulge behind the pillar. As the anterior pillar had atrophied after the tonsillectomy, the simulation of a tonsil was complete. The severe pain referred to the ear, the mastoid tenderness, and the rigor, coupled with a long, swinging temperature, gave rise to the suspicion of an acute aural condition.

CASE 3. *Retropharyngeal abscess, a complication of the operation for tonsil and adenoids.*—Two weeks after guillotining of tonsils, a child was admitted pale and ill, with a temperature of 103°, a rigid neck, and slight adenitis on one side. Mucopus welled out from the post-nasal space. No foreign body—e.g., a retained swab—was present. For the next week the temperature remained raised; then the source of the pus was traced to a leaking centrally situated

retropharyngeal abscess which was visible when the tongue was depressed. The abscess was incised from above as far down as the arytenoids and recovery was rapid.

CASE 4. *Bilateral acute retropharyngeal abscess, simulating Hodgkin's disease.*—A male, aged 28, who had suffered from dysphagia for a few weeks, had a bilateral cervical swelling the size of a golf ball. At the angle of the jaw on each side was an enlarged gland, with one or two smaller satellite glands. The mass was firm, non-fluctuant, and free from tenderness. The posterior wall of the pharynx, medial to the left posterior pillar, was elevated by a globular mass, very hard and painless. The tonsils were small, septic, and embedded. The Wassermann reaction was negative. A record needle attached to a syringe was inserted into the pharyngeal swelling without any anæsthetic, and the aspiration revealed pus. The abscess was drained via the pharynx, and the entire cervical mass on that side subsided. A finger inserted through the pharyngeal opening entered the cervical mass. The glands on the other side subsided, but within three weeks another cervical swelling arose on the right side, forming a marked bulge occupying the masto-mandibular recess and reaching down as far as the angle of the jaw, where another discrete gland, the size of a walnut, was present. There was no tenderness and the patient was well. Behind and medial to the posterior pillar of this side was a swelling, free from tenderness, hard and covered by normal mucosa. At the end of a week it was in statu quo. In view of the previous abscess, a needle was inserted into the retropharyngeal mass and the patient gagged violently, with the result that the syringe attached to the needle filled with pus immediately, without any manœuvring. The blood count was 58,000 white cells. The abscess was incised via the pharynx.

In this case the diagnosis of suppuration was only possible after using the exploration needle and syringe. Clinically the swelling resembled a lymphadenoma, in view of the multiplicity, size, and physical signs of the glands. A section from the gland removed at the time of drainage eliminated this disease. Within 24 hours the white cell count was down to 12,000. After another cervical abscess, which was incised, convalescence was protracted but normal.

CASE 5. *A posterior "quinsy" simulating a retropharyngeal abscess.*—A female, aged 30, had a sore-throat and dysphagia for a few days, with pyrexia. The right tonsil was pushed forward by an inflammatory mass, apparently behind the posterior pillar. The anterior pillar was normal. A collection of submucous pus was evacuated. This cured the abscess, which was not deep to the fascial pharyngeal investment and therefore must be looked upon as a "posterior quinsy," in view of its proximity to the tonsil capsule and the fact that it was submucous.

The true acute retropharyngeal abscess is well behind the tonsil, and lies behind the posterior pillar, outside the fascial covering of the pharynx. It is not in juxtaposition with the tonsil capsule as is a quinsy.

CASE 6. *Retropharyngeal abscess in an infant simulating laryngeal diphtheria; diagnosis only made by direct laryngoscope.*—An infant was admitted gravely ill from infection, with a history of recent respiratory embarrassment. When she fell asleep the jaw fell back and respiration ceased. Holding the jaw forward re-established respiration. The condition was that observed during deep anæsthesia when, unless the jaw is held forward, the tongue falls back and breathing is impossible. The cause of this curious phenomenon was obscure. Laryngeal diphtheria was assumed and serum administered.

Direct laryngoscopy was made,* the infant being rolled in a blanket and its head drawn over the edge of the bed. A globular centrally situated swelling with its summit opposite the larynx, invisible with the ordinary tongue depressor, was observed. It was a retropharyngeal abscess, and the centrally placed eminence acted as a stopper to the larynx. With the onset of sleep the larynx fell back and was completely occluded by the swelling. The abscess was incised as described above, without an anæsthetic, the head being held by an assistant. The breathing was restored to normal and the child had its first sleep for days. Convalescence was uneventful.

SUMMARY

1. Cases of acute retropharyngeal abscess are recorded, and a distinction is drawn between this condition and a "posterior quinsy."

2. The use of an exploring syringe and the use of the direct laryngoscope as an aid to diagnosis are described.

3. A description is given of a tranquil method for incising and draining the abscess through the pharyngeal wall.

* To minimise any chance of the observer having diphtheritic material coughed at him, I use a laryngoscope with a celluloid screen attachment made by the Medical Supply Association.

Clinical and Laboratory Notes

FOUR CASES OF FUSO-SPIROCHÆTAL DISEASE OF THE LUNGS

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THE literature of pulmonary fuso-spirochætal disease—i.e., the infection set up by the symbiotic organisms associated with Vincent's angina—is now very considerable. David T. Smith,[1] who had reported 14 cases in New York, reviewed the whole subject in 1928 and gave no less than 128 references. With the exception, however, of the cases published by Campbell and Dyas[2] in 1917, which appear to have occurred amongst Canadian troops in England, no British cases had been published up to 1928. In my latest copy (old editions accumulate in 30 years' professional life) of "Taylor's Medicine," the thirteenth edition, dated 1925, the condition is not mentioned. Recent work in the London chest hospitals has, however, demonstrated that the condition is a common one. The use of the bronchoscope, in particular, has greatly helped in clarifying our conceptions and in demonstrating the parts played by anaerobic organisms, often acting in symbiosis, in the causation of bronchial and pulmonary disease.

THE CASE RECORDS

The notes of four cases which I have met during the past three months in the north-west of Derbyshire may be of interest, if only in drawing some attention to a common pulmonary condition which is, I believe, frequently mistaken for tuberculosis, and may, for example, sometimes constitute the "infective" element in "infective silicosis":—

CASE 1.—A female, aged 42, had several teeth removed under light ether anæsthesia on Feb. 21st, 1932. On March 1st she called in her medical attendant as she had been feeling ill for two days; her temperature was 100° F., but she had no objective signs. Three days afterwards the temperature was 103·5°. On March 4th an irritating cough came on, and the patient complained of an unpleasant taste in the mouth. On March 5th she coughed up a quantity of purulent offensive material. This expectoration became copious in the following days, and the offensive smell became obvious on entering the room.

I saw the patient in consultation with her medical attendant on March 9th. Physical examination failed to locate any definite abscess. Examination of the sputum at the Derby County Laboratory showed streptococci, pneumococci, *Micrococcus tetragenus*, gram-negative bacilli, and Vincent's fusiform bacillus with spirochætes, in large numbers. I recommended postural drainage, creosote perles by the mouth, and, on the suggestion of Dr. S. M. Ross, arsenical preparations intravenously.

Dr. G. Sawdon, the patient's medical attendant, reports the subsequent course as follows: "Stabilarsan, 0·3 g., was given intravenously and some improvement was obtained, but the condition was still maintained, with paroxysmal attacks of coughing which were very exhausting, and subsequent evacuation of foul-smelling pus which was now dark anchovy coloured. On March 27th a further injection of 0·45 g. of stabilarsan was given intravenously. By next day the cough and expectoration had ceased and the temperature was normal; the patient then made an uninterrupted recovery." No sputum is now available for further examination.

[1] Tubercle, 1928, ix., 420.

[2] Jour. Amer. Med. Assoc., 1917, lxviii., 1596, quoted by Smith (ref. 1).

CASE 2.—A female, aged 28, had all her teeth extracted under ether anæsthesia on Feb. 13th, 1932. She became very ill about March 1st, and on March 14th I was asked to see her by her medical attendant, who wrote: "She is, I think, suffering from acute pulmonary tuberculosis." Her temperature was 103·2°, and her pulse-rate 140 per minute, and an offensive smell was obvious on entering the room. The sputum was brown, blood-stained, and evil-smelling. Physical examination located an extensive lesion in the right lower lobe, the signs being those of consolidation of lung tissues, with commencing softening. Examination of the sputum at the Derby County Laboratory showed streptococci, pneumococci, *Micrococcus catarrhalis*, a large number of fusiform bacilli and spirochætes, but no tubercle bacilli.

The patient was moved to hospital, where the temperature gradually fell and the condition improved under general treatment. N.A.B., 0·15 g., was given intravenously on March 23rd; the patient refused a second injection. By March 26th the temperature had dropped below 98·4°, and the pulse-rate was under 90 per minute. The sputum disappeared altogether, and none could be procured for a re-examination.

CASE 3.—A male, aged 30, a cooper by trade, was referred to me by his panel doctor on March 1st, 1932, as possibly a case of pulmonary tuberculosis. He gave a history of an influenzal attack with bloody foul-smelling expectoration seven weeks previously. Patient stated that he had not been well for years. A sister had died of pulmonary tuberculosis some 12 years before. All the teeth of the upper jaw had been extracted under local anæsthesia three years previously. Pyorrhœa was present in the gums of the lower jaw. The pulse and temperature were normal. Physical examination of the chest suggested generalised pulmonary fibrosis, but the skiagram showed no definite lesions nor any "leafless tree" shadows. Examination of sputum was negative for tubercle bacilli, but showed streptococci pneumococci, Vincent's fusiform bacilli, and spirochætes. The patient continues under treatment.

CASE 4.—A male, aged 59, a discharged soldier of the regular army, now a mill labourer, was referred to me on April 27th by his panel doctor as "suspected chronic phthisis." The patient complained of loss of weight, night sweats, and severe cough, without much expectoration. His temperature was 99°, and his pulse-rate 120. Loud rhonchi were present over both sides of chest, with moist râles towards the bases. He had lost many teeth; those that were left were carious, and the incisors were loose and embedded in pyorrhœic sockets. The sputum was negative for tubercle bacilli, but contained streptococci, pneumococci, and fusiform bacilli and spirochætes in large numbers.

A skiagram showed a generally hazy chest. The patient gave a history of gonorrhœa and buboes in India 35 years before, and a Wassermann reaction was positive on May 12th, 1932.

The county pathologist reports: "The spirochætes are indistinguishable from those usually associated with Vincent's angina. Dark-ground illumination failed to show any other variety." The patient was referred back to his own doctor for antisyphilitic treatment. He is already back at his work and has gained several pounds in weight.

COMMENT

It is to be noted that three of these four cases were referred to me as suspected pulmonary tuberculosis; one had actually been notified as tuberculous. There is, I fear, little doubt that in the past many so-called "T.B. minus" cases of tuberculosis were pulmonary infections of this type. Looking back over an experience of 14 years as a tuberculosis officer, this type of pulmonary disease now seems to stand out plainly enough to be recognised clinically. Dr. Smith writes: "After proper allowance is made for pleomorphism it is about as easy to pick out a case of this disease in the wards of a hospital as one of tuberculosis." The cavities of carious teeth, pyorrhœic tooth sockets and, according to Dr. Roodhouse Gloyne, the crypts of unhealthy tonsils seem to be the natural home of *B. fusiformis* and *Spirochæta vincenti*. The ecology has not been fully investigated, but the organisms appear to exist in symbiosis. Tunnicliff and Smith observed, however, that pure cultures of fusiform bacilli can develop into spirilla-like forms.[1]

In three of my cases wholesale removal of teeth had been undertaken for pyorrhœa and caries—in the two acute cases within a fortnight of the onset of the symptoms, in one chronic case three years previously. In the acute cases general ether anæsthesia was employed, and it seems reasonable to conclude that the infective material was aspirated into the bronchi during anæsthesia. The fourth case had a mouthful of septic dental stumps. Smith writes that the spirochætes are absolute anaerobes and disappear very quickly from the sputum when it is exposed to the air; consequently the examination should be made within 30 minutes after the material is expectorated. If, however, the sputum is bloody, the blood protects the spiral organisms, and they may be found even 10 or 12 hours later. In my four cases the sputum was forwarded by post to the Derbyshire county bacteriological laboratory, and a period of 18 to 24 hours elapsed between the expectoration and the examination. The stain used was dilute carbol-fuchsin, without heat. Smith emphasises the necessity for washing the sputum before examination, doubtless in order to safeguard against buccal contamination.

TREATMENT

Smith[1] and Scott Pinchin and Morlock[2] recommend treatment by arsenical preparations. In one of the acute cases reported here two intravenous injections of stabilarsan, 0·3 g. and 0·45 g., were given, and this treatment seemed to have had a specific curative effect. The other patient had recovered from the acute stage before an injection of 0·15 g. N.A.B. was given. Where a definite abscess can be localised and drained through the bronchoscope, direct injection of a suitable dose of the drug directly into the abscess cavity has been suggested, care being taken that none of the drug escapes into the trachea or bronchi, as it is intensely irritating. Syphilologists, however, warn us against such a practice, on the grounds that local inflammation and sloughing might occur and that arsenicals produce their action on the spirochæte indirectly, through the medium of a toxalbumin. If untreated, the condition appears to persist as a chronic purulent or bloody bronchitis with offensive expectoration and eventual formation of bronchiectatic cavities.

My thanks are due to the county bacteriologists, Dr. Sheila M. Ross and Mr. C. F. Peckham, for their help and suggestions, and to Drs. Sawdon and Drabble for their notes on the progress of their cases.

A CASE OF CHRONIC TETANY

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THE case here recorded is of interest because the symptoms were such that for several years the diagnosis of a "functional" disorder was maintained.

The patient, a single woman aged 40, was admitted to the Maudsley Hospital from the out-patient

[2] Pinchin, A. J. Scott, and Morlock, H. V.: Proc. Tubercle Assoc., Tubercle, 1932, xiii., 374; and personal communications.

department on Sept. 8th, 1931. She had come up that afternoon complaining of pains in her stomach and "drawing" of her arms and fingers, with consequent depression.

The family history was negative.

Past history.—She was the fifth of eight surviving children of a family in poor circumstances, but she never experienced actual want. Her early development was normal, but she became "weak in the legs" at the age of 4 and was considered delicate as a child. Nevertheless she was able to attend school regularly, though she only reached standard IV. She entered domestic service at the age of 15, and was a regular and steady worker until she gave up her last position shortly before the onset of the present illness. She was of a quiet, sensitive, and retiring disposition, with few interests, yet contented with her lot. She always tired easily, but her physical health was good and she was never in hospital. Her periods did not start until the age of 19. They were quite regular. She had some dysmenorrhœa when young. Her sexual life seemed devoid of interest or episode.

History of present illness.—She gave up work some five years before admission to look after her mother and sister who were ill. This preyed on her mind and at about the same time the symptoms developed. There was considerable variation in their severity, and she spent months at a time free from cramps or pain, but never felt fit enough to start work again.

The attacks from which she suffered had in general the following characteristics:—

About once a month, usually just before her periods, though occasionally in between them, she would suffer from a "squeezing" pain in the stomach to be followed by shivering and diarrhœa. This would last for several days and be a sign to all that an attack was due. Her fingers would then go "cold and black and start doubling up." These painful cramps would last two or three days and sometimes be accompanied by twitching of the face and in the region of the elbows. Sleep became difficult, and she would cry with pain. The cramps would then pass off rather suddenly leaving an ache.

She became run down, lacking in interest, low-spirited, and prone to weep easily. She also became very thin. Her condition was attributed both by herself and by her medical attendants to "nerves." The attack which brought her up to hospital was the worst she had experienced, and had started four or five days before admission. Her period was about due.

Condition on admission.—She was a pale, wan, thin, puny woman, looking older than her age. Her manner was quiet, resigned, and pleasant. She was a good witness, if allowance be made for her rather low intelligence and limited vocabulary. Her general physical condition was poor. Height 4 ft. 8 in., weight 6 st. 4 lb. Her hair was rather sparse and turning grey, her jaws edentulous. Her lungs, heart, and abdomen showed no abnormalities. Her arteries were not thickened. Blood pressure 110/75. She was very knock-kneed and showed well-marked bowing of the right tibia, such as results from rickets when a child.

Tetanic spasms.—She showed clearly the classical features of tetany. Her upper extremities were flexed at the elbows, wrists, and fingers, the tendon of palmaris longus standing out prominently. She was unable to extend the wrists or fingers and showed flexor jerkings, together with much pain and discomfort, when her blood pressure was taken. Chvostek's sign was present. There were no signs of affection of her lower extremities, except for some slight increase of the tendon reflexes. Spasms, when not actually present, could easily be produced by a few minutes over-breathing.

Special tests.—Urine normal. Blood count: very slight anæmia (circa 4,250,000 red cells per c.mm.). Wassermann reaction negative. Serum calcium 6·5 mg. per 100 c.cm. Plasma inorganic phosphorous 3·1 mg. per 100 c.cm. Fæces normal. X rays: evidence old rickets, especially right tibia, ? some rarefaction. Eyes (Mr. R. Foster Moore) fundi normal. Lenticular opacities present.

Progress.—Definite carpopedal spasms developed, and continued fairly frequently for ten days after admission. In the intervals they could easily be elicited by over-breathing, and Trousseau's and Chvostek's signs continued to be present. The serum calcium remained between 6·5 and 6·7 mg. per 100 c.cm. and inorganic phosphorus between 3·1 and 3·4 mg. Intravenous calcium chloride gave temporary relief. She was given lactate grs. 10 t.d.s. and lactose grs. 30 daily in milk on Sept. 25th. The spasms began to diminish rapidly in frequency and severity, and were absent after Sept. 29th. On that date the serum calcium was 8·8 mg. and the plasma phosphorus 3·4 mg. Phosphatase (Kay) 0·25. Good progress continued and on Oct. 5th, when her calcium was 8·6 and her phosphorus 3·7 mg., Trousseau's and Chvostek's signs were negative, and carpopedal spasms could no longer be produced by over-breathing. Despite the return of menstruation on Nov. 2nd, her calcium and phosphorus were respectively 10·5 and 3·25 mg. She was discharged on Nov. 5th, having gained a stone in weight and vastly improved in health and spirits.

After her discharge she attended the out-patient department periodically until about two months ago and has been keeping well. Her periods have been regular and unaccompanied by tetanic symptoms. She has had occasional slight aching of the hands and feelings of languor, not particularly associated with menstruation. She has continued with calcium lactate and lactose.

COMMENT

As psychiatrists, we feel some diffidence in reporting yet another case in which a definite physical disease had been overlooked and the erroneous diagnosis of a purely "functional" disorder maintained. The mistake is too commonly the other way round. It was comparatively easy to make the correct deductions when the patient was seen in actual tetanic spasm, but it appears that no physician had had this opportunity before. Yet it is possible that a little more psychiatric interest, the taking of a more detailed history and a more exact searching inquiry into all circumstances of the attacks, would have roused doubts, and led to the correct diagnosis at an earlier date. The readiness of the patient to accept a "nervous" origin for the complaint might in itself have afforded grounds for suspicion. As it was, the history of domestic worries coinciding with the onset appears to have been accepted too readily as supplying a satisfactory psychogenesis, so that further interest lapsed, though at one period the change in colour and local discomfort in her hands suggested the diagnosis of some vasomotor disorder allied to Raynaud's disease. Her complaint was certainly suggestive of such a condition.

Donald Hunter,[1] in his Goulstonian lectures for 1930, has reviewed the literature and summarised the knowledge at present available of disorders in calcium and phosphorus metabolism. Our case seems most closely allied to the so-called idiopathic steatorrhœas of adults, which is supposed to arise from a defect in the absorption in vitamin D. It has many features in common with one of the cases which he describes under this heading. Both had a small structure and poor physique, evidence of past rickets, loss of weight, bony rarefaction, lens opacities and low serum calcium, together with attacks of tetany. It is true that our case had no diarrhœa whilst in hospital, and the fæces were not abnormal. There was, however, a definite history of such symptoms. With such a history the diagnosis of steatorrhœa is the most probable, though a somewhat lower figure for inorganic phosphorus might have been expected.

As regards treatment, irradiated ergosterol and fat restriction were not tried, as the case did well on calcium lactate and lactose.

Our thanks are due to Dr. Edward Mapother, medical superintendent of the Maudsley Hospital, for permission to publish this case.

[1] THE LANCET, 1930, i., 897, 947, 999.

REVIEWS AND NOTICES OF BOOKS

An Introduction to Analytical Psychotherapy

By T. A. Ross, M.D., F.R.C.P.E., M.R.C.P., Medical Director of the Cassel Hospital for Functional Nervous Disorders. London: Edward Arnold and Co. 1932. Pp. 203. 10*s.* 6*d.*

IN his preface Dr. Ross expresses a fear that the teachings of Freud may become lost to our profession, the Freudians having given up the general physician as unteachable. Yet he would surely agree that any modern views about the psychoneuroses inevitably bear the mark of Freud's influence, even if acknowledgment may sometimes be lacking. It is true that psycho-analytical publications are rarely planned for the ordinary medical reader and that he cannot be expected to go to the fountain head and study for himself the development of Freud's work, fascinating as that is. In this book is a rich store of observations designed both to develop psycho-analytical theory—as Dr. Ross is compelled to see it—and to illustrate therapeutic methods. Dr. Ross judges theory in the light of his own experience and his methods are the application of psycho-analytical knowledge rather than psycho-analysis proper; this attitude is indicated in the title of the book.

A survey of the views of Janet and Morton Prince, with a brief dismissal of Adler's contribution to psychopathology, leads on to a demonstration of the necessity of a theory of the unconscious, which conveniently sums up a mass of observations and has the same validity that is attached to other scientific conceptions. Things happen as if the unconscious exists and, says Dr. Ross, if it helps anyone the proviso "if indeed it exists" may be understood each time the expression is used. Chapters on dreams and sex problems, transference, fixation, and regression combine theory with practice, and a discussion of the dangers of analytic investigation puts them into their proper relation with the dangers attached to any other active medical or surgical procedure. The chapter on technique provides no cut-and-dried rules but a description of difficulties and pitfalls and the way to avoid them; it is useful not only to the would-be psychotherapist but to the physician whose aim is to obtain a true picture of the patient's troubles. The orthodox psycho-analyst will, perhaps, find in the brevity of the description of free association an explanation of Dr. Ross's failure to satisfy himself of the universality of certain contents of the unconscious, for their discovery is claimed to depend upon a painstaking use of this method. Opportunity for such criticism is bound to arise when a worker on this big subject only accepts what he himself finds; it does not lessen the value of the book which, with no glossing over of difficulties, fulfils in simple and straightforward fashion the promise of its title.

An Outline for Boys and Girls and their Parents

Edited by NAOMI MITCHISON. London: Victor Gollancz. 1932. Pp. 928. With 166 illustrations. 8*s.* 6*d.*

THIS is an attempt to set out the foundations of knowledge for the benefit primarily of children, but the writers have had their eyes also upon parents to whom resort for explanations or supplementary information may be had. The plan of the book is ingenious. In the first place the appeal is to the individual reader, and to him it is explained what he is in the chapters on physiology, biology, and chemistry. His place in the general scheme of things is then made clear by the chapters on chemistry again, on physics and on applied biology; and now, knowing his place on earth, he is invited to consider that earth as it was and is, and its position in cosmogony. Brief principles of astronomy follow. After the scientific section, which occupies the first third of the compendium, a group of writers attack the huge task of telling the story of civilisation from the primal great discoveries of mankind down to the present day, with considerations of future problems based upon ancient experience and its progressive developments. A series of chapters deal with the physical and social story, with the arrival of the family unit and its inclusion in larger groups, and with the rise of the national idea. Mesopotamia, Greece, Egypt, and Rome are shown to have played their assorted parts in the evolution of the world as we now know it, being influenced by various aspirations for good and ill, and the tenets of different religions. A chapter is devoted to the occurrences of the last 30 years, in which the Great War is discussed as a sequel to the national strifes engendered by material rivalries, when the plea for international activities, conducted upon settled plans, is advanced forcibly. This section closes with chapters on the machinery of society as exemplified by the practices of law and its relation to government, and by the power of money with its economic implications. A third section, the shortest, deals with the arts, and is designed to inculcate in the mind of the young reader their value in making life so much more worth living.

The scientific section is thoroughly well done. Within the limits of space prescribed, the knowledge of to-day is outlined accurately, what matters much being drawn with a firm hand, details irrelevant to an outline being duly omitted. The manner in which the difficult subject of physiology is dealt with by Prof. Winifred Cullis, in collaboration with Miss Evelyn Hewer, D.Sc., forms a sound example of the right way to introduce new lessons to young minds, and the same congratulations can be extended to Mr. John Pilley, D.Sc., who, however, expounds chemistry in a different manner. He draws no outline of the whole subject, but explains with great skill the fundamental structure upon which modern chemistry rests, giving the best brief account we remember to have read of the properties of matter, and of the researches which have led up to their discovery.

The value of the social section of the book is more open to debate, as the lessons which are inculcated here are dependent frequently upon opinions and not upon scientific results. The opinions, even when widely diverse fields of social evolution and organisation are under discussion, display great unity, and the treatment recommended for the ills under which society suffers is usually drastic, perhaps too drastic. The medical mind must hold that meddlesome medicine may prolong disease, and that remedies that would be of value in a later stage may be less than useless when applied prematurely. A passionate desire to do the best by the patient is not accepted scientifically as an apology for malpraxis. Two essays in this section stand out for their practical worth, that on law and government by Mr. G. R. Mitchison, and that on economics by Mr. Hugh Gaitskell. Mr.

Mitchison's summary of our legal machinery and analysis of our pattern of government are made beautifully clear by application to a breach of the law that might be committed by anyone—say by any parent for whom the book is written. Mr. Gaitskell explains the controlling power and international flow of money, so that, for example, the meaning of the gold standard and the bank-rate, and the arguments for and against protection become comprehensible. Both the lawyer and the economist are dealing with facts, and by confining themselves to facts may disappoint the "forward-thinking parents and teachers" who, says a strident wrapper, want the book; ordinary parents and teachers will welcome the direct guidance given in difficult places, and may not regret the absence of vague directions to Utopia.

The book is well got up, modestly priced, and profusely illustrated. The labour expended by all concerned in its production should earn substantial reward.

L'occlusion intestinale

By PIERRE MOIROUD, Chirurgien des Hôpitaux de Marseille. Paris: Masson et Cie. Pp. 120. Fr.18.

THIS is an excellent little monograph, written with Gallic clarity and decision. Although the diagnosis of obstruction is well described, the chief object of the book is to give an account of and to evaluate the different methods of treatment; above all to emphasise the modern views which have led to chloride therapy. It can be warmly recommended.

Recent Work on Ptosis

(*Prolapse*) *of the Female Pelvic Viscera.* By E. HESKETH ROBERTS, F.R.C.S. Edin., Gynæcological Surgeon, St. John's Hospital, Lewisham. London: Dickson and Scudamore. Pp. 110. 9*s.* 6*d.*

THE ætiology of prolapse is a subject which periodically gives rise to warm discussion. The anatomy of the pelvic fascia and pelvic cellular tissue is difficult to understand and there is much dispute as to which structures are important in supporting the pelvic organs. Careful descriptions of original anatomical research are few, but recently Amreich has made a magnificent contribution in the new Peham-Amreich "Gynäkologische Operationslehre." Mr. Hesketh Roberts makes no reference to this work although it has attracted great attention. His small book hardly displays the critical estimate of scientific evidence which is to be expected in a modern work, though he has read widely and reviews usefully a great deal of the literature.

Traité de physiologie normale et pathologique

By Prof. G. H. ROGER and Prof. LEON BINET, in the Faculty of Medicine, Paris. Vol. VI. *Circulation.* By Six Collaborators. Paris: Masson et Cie. 1932. Pp. 589. Fr.90.

IN this part of Roger and Binet's treatise on physiology the embryology and anatomy of the heart are briefly described, and the hæmodynamics of the heart-chambers and the mechanism of production of the heart sounds are discussed. A fair account of our knowledge of the circulation through the coronary arteries is given, including a discussion of their innervation. Cardiac automatism and innervation are treated at length, the physiopathology of the heart rhythm is described, and a short section on the electrocardiogram is included. The arterial, venous, and capillary circulations are well set out, and recent work on their nervous and hormonal control is noted. The book is primarily written for physiologists, but the clinician will find it interesting and readable. The style is elegant, but the illustrations and general production do not reach a very high standard.

United States Army X Ray Manual

Authorised by the Surgeon-General of the Army. Second edition. Rewritten and edited by Lieut.-Colonel H. C. PILLSBURY, M.D. U.S.A. London: H. K. Lewis and Co., Ltd. 1932. Pp. 482. 25*s.*

THE first edition of this standard manual was published in 1920 and was the work of a number of collaborators who had gained experience of the needs of radiologists in the war. The result as an elementary treatise was entirely satisfactory. The second edition has been revised and rewritten by Lieut.-Colonel H. C. Pillsbury by direction of the Surgeon-General. It is clear that instructions have been given to restrict the size of the book so that it should be no larger than its predecessor. In this task the author has succeeded, but at a heavy cost, for the scope of radiology has expanded rapidly in the last 12 years. In spite of the omission of sections that were devoted to various obsolete methods of localisation and to X ray therapy, there is so much new material to be included that the author has been placed at a serious disadvantage in his attempt to cover the whole field of radio-diagnosis. Half the book is devoted to X ray physics, technique, and localisation, which leaves inadequate space for a summary of the vast subject. Colonel Pillsbury has followed standard lines and the limited space available has precluded discussion. He has, however, succeeded in including a considerable amount of reliable information and the book gives a useful outline on which to build up a sound general knowledge of radiology.

Journal of Pathology and Bacteriology

THE September number (Vol. XXXV., No. 5) contains the following papers: The Antigenic Properties of Different Fractions of Staphylococcus, by K. W. Goadby (London). The capacity to produce an antibody response gradually disappears as the organisms are chemically disintegrated.—The Precipitation of Diphtheria Toxoid by Metallic Salts and the Antigenic Value of the Precipitates so Formed, by Margaret Llewellyn Smith (London). Alum compounds of toxin or toxoid are known to be exceptionally good antigens. Other procedures are here tested and goods results were obtained with colloidal aluminium hydroxide, zirconyl chloride, and calcium phosphate.—The Rabbit as a Means of Distinguishing the Human from the Bovine Type of Tubercle Bacillus: the Lesions Caused in the Rabbit by Tubercle Bacilli of the Human Type, by L. Cobbett (Cambridge). Human tubercle bacilli injected into rabbits exceptionally cause either a transient generalised infection or severe progressive lesions.—The Production of Bacteriotropins for Hæmolytic Streptococci by Patients Infected with that Organism, by R. Hare (London). Opsonins for the homologous organisms develop during puerperal infections except in rapidly fatal cases.—The Post-embryonic Development of the Erythrocytes of the Albino Rat, by Christianna Smith (London). A precise quantitative study of the changes in the red cells in infancy. About the time of birth there is a considerable decrease in size and variability and the population of red cells is almost completely changed in the course of a few days.—Primary Round-celled Sarcoma of the Peritoneum, by T. F. Hewer (Khartoum). In a Sudanese of 40.—Tuberculosis of Systemic Arteries with Fatal Rupture: a Report of Two Cases, by H. L. Sheehan and R. Whitehead (Manchester). Of the subclavian and splenic arteries.

—On the Occurrence of Clumps of Asbestosis Bodies in the Sputum of Asbestos Workers, by M. J. Stewart, N. Tattersall, and A. C. Haddow (Leeds). When the lung begins to break up, asbestosis bodies are found in the sputum in clumps which represent alveoli.—The Pathological Changes Produced in the Tissues by Corrosive Sublimate, with Special Reference to the Early Phases of Cell Degeneration and to Changes in the Blood Fat, by R. F. Ogilvie (Edinburgh). In the liver, kidney, and heart muscle the mitochondria break up into granules which diffuse throughout the cytoplasm and form the granules characteristic of cloudy swelling. There is an immediate and unexplained rise in the blood fat, followed by a fall and a second rise.—The Red Cells in Microcytic Anæmia (Witts), by C. Price-Jones (London). The condition of the red cells before, during, and after cure by iron salts is described by the author's well-known methods. The differentiation of anæmic from orthochromic cells is particularly interesting, and the proportions of the two kinds are a good index of the state of the patient.—Ligation of the Common Bile-duct, by G. R. Cameron and C. L. Oakley (London). Early focal necroses are healed. There is a great proliferation of bile-ducts which surround, invade, and disorganise the lobules. A divided bile-duct may reunite. Full historical account and literature.—Some Observations on the Eosinophil Cell, by J. H. Biggart (Belfast). Tissue eosinophils are emigrated blood leucocytes which are, in adult life, found only in the bone-marrow. Local eosinophilia can be produced in guinea-pigs by the injection of proteins or peptones, but not by amino-acids.

ERRATUM.—The price of the book by Mr. Arthur G. Wells, entitled "The Discharging Ear," which was reviewed in THE LANCET last week, is 2s. 6d., and not as stated.

BRITISH MEDICAL ASSOCIATION

CENTENARY MEETING IN LONDON

(*Concluded from p. 684*)

SECTION OF DISEASES OF CHILDREN

Bronchiectasis

Prof. CHARLES MCNEIL (Edinburgh) said that with the introduction of intratracheal injections of lipiodol in 1922 a precise study of the morbid anatomy of bronchiectasis in the living subject became possible, and Findlay and Graham in Glasgow in 1927 showed radiographically different degrees and types of dilatation in children. Recently new methods of treatment by surgical procedure and bronchoscopic lavage had been attempted. The condition usually dated from an acute respiratory illness (often measles or whooping-cough) in early childhood. The cough persisted after the illness, and later became paroxysmal; bouts occurred especially on waking, and often ended in vomiting. Sputum might be copious or scanty; and in children was generally not fetid. Free hæmoptysis was uncommon in childhood, though recurrent hæmoptysis might occur in older patients. At times the cough might disappear entirely, but the child was subject to exacerbations of cough with pyrexia. The general health was surprisingly good. Physical signs were often less reliable than symptoms in diagnosis, but variability in the auscultation signs was significant. Prof. McNeil described and illustrated two types of bronchiectasis: unilateral bronchiectasis with massive fibrosis, the more benign type, and the commoner bilateral type. The milder cases of the bilateral type shaded off into chronic bronchitis with fibrous changes in the bronchial wall. His experience suggested that if children survived the first year or two after the condition developed the chance of survival through the rest of childhood was good, and an active working life was often possible. The condition might remain stationary over a number of years. Post-mortem room observations led Prof. McNeil to believe that the primary change in early bronchiectasis was an intense inflammation of the bronchi which destroyed their walls, rather than fibroid changes in the lung substance.

Medical treatment was only palliative, but the most effectual was daily postural drainage, the child lying prone for at least half an hour on a steep inclined plane. Possibly with improved technique for bronchoscopic lavage a real advance in treatment might be achieved. The same applied to radical surgical treatment, the results of which hitherto had not been encouraging.

Dr. J. H. THURSFIELD (London) held that bronchiectasis, as described by Laennec and as demonstrated by lipiodol, was an advanced stage of a common condition—namely, fibrosis of the lung—and he suggested that the term bronchiectasis should be dropped. In most cases in which fibrosis had occurred in the lung there was some dilatation of bronchioles, and where this was only slight and not demonstrable in radiograms recovery often occurred.

Dr. STANLEY GRAHAM (Glasgow) said that any explanation of the ætiological mechanism must take into account the shrinking of the affected side due to fibrosis which almost invariably occurred. He believed, like Dr. Thursfield, that bronchiectatic dilatation was the direct result of pulmonary fibrosis. Nearly all children with bronchiectasis were markedly under normal height, and their slow growth probably in part explained their fairly good nutrition. He agreed that postural drainage was in most cases the best available method of treatment.

He had had the opportunity of re-examining with lipiodol and X rays 14 children (out of his series of 23) after an interval of three to six years, and six were apparently either stationary or improved. Six others of the series had died.

Mr. J. E. H. ROBERTS (London) gave an account of bronchiectasis from the surgical aspect. The term was used to cover very different clinical entities, including a condition which was congenital in origin. Whether or not radical surgical treatment was eventually attempted, palliative measures must first be adopted to get the bronchial tree as dry as possible. Bronchoscopy might be helpful, since a stricture favouring stagnation of discharge might be removable and aspiration might produce more healthy bronchioles. Radical treatment involved either collapse of a lung and of its dilated bronchioles, or lobectomy. The disease must be unilateral for collapse to be employed. He had found it impossible to predict from clinical or radiographical examinations whether or not in an individual case a lung could be collapsed. He showed remarkably good results in certain cases following collapse of lung by artificial pneumothorax, phrenic avulsion, or by thoracoplasty. Lobectomy was a possible method of treatment when the condition affected only one lobe, but had had a mortality of about 50 per cent. Recently a new technique had been employed in Toronto, and 14 successful cases were reported. Mr. Roberts and his colleague Mr. Nelson had operated on two cases by the new method, and he felt that if the method fulfilled its promise lobectomy would be the operation of choice for this group of cases.

Dr. H. TUKE ASHBY (Manchester) agreed that

since bronchiectasis was rare in adult life children with this condition must either die early or make fair recoveries. He had followed up 27 cases: of 11 cases of the unilateral type only 4 were living, whereas of 16 of the bilateral type 11 were living and doing moderately well. Hence his figures suggested that the bilateral was the more benign type.

Dr. N. B. CAPON (Liverpool) was struck by two facts: (*a*) that the text-book description of bronchiectasis was the description of a terminal condition; (*b*) that this condition was found in hospital rather than in private practice. This suggested that the condition was often preventable. If cough, with or without chronic bronchitis, persisted after whooping-cough, measles, influenza, or pneumonia, or if there were fairly constant crepitations to be heard over one area of lung, great efforts should be made to provide for the child in poor circumstances the dietetic treatment and perhaps climatic change available for the child in better circumstances. He regarded as important measures designed to get good lung expansion after pneumonia or atelectasis. After pneumonia the sound lung should be partially immobilised and the child encouraged to take deep breaths several times daily. If the apparatus were available carbon dioxide inhalation could be employed.

Prof. ARMAND-DELILLE (Paris) described with lantern slides dilatation of the bronchioles occurring in cases of tuberculosis.

Dr. C. P. LAPAGE (Manchester) had analysed 40 cases. Most of these had begun at an early age—some under 4 months—and followed broncho-pneumonia; not many followed measles or whooping-cough. He pointed out the need of dealing with any infection of the upper air passages, whether in the tonsils or adenoids or the nasal sinuses.

Dr. E. FLETCHER (London) drew attention to the association between atelectasis or congenital malformation and the development of bronchiectasis.

Vitamins and Minerals in Diet

Dr. ALAN BROWN (Toronto) described work undertaken by himself and his colleagues at the Hospital for Sick Children, Toronto, on the rôle of vitamins and minerals in growth and resistance to disease. Most ordinary mixed diets, he said, would supply the minerals required by the human body, but the supply in the diet of calcium, iron, and iodine should not be left to chance. To provide a growing child with sufficient calcium (a 10-year-old child required about 1 g. daily) milk must be included in his diet, though leafy vegetables would supply part of the calcium requirement. On the other hand, both milk and cereal were deficient in iron, and this could be supplied in egg yolk, liver, spinach. Iodine deficiency was not a pressing problem in the British Isles. He showed the influence of mineral deficiency and of vitamin deficiency in retarding the growth and lowering the resistance of rats; a deficiency of any of the known vitamins excepting E resulted in loss of weight. For an adequate supply of vitamin D children were ordinarily dependent on the action of sunlight on the skin; but it must be remembered that for as much as five to six months in the year sunlight in this country probably had a low anti-rachitic potency. In an ordinary diet 30 to 60 per cent. consisted of cereals containing little vitamin, calcium, or iron. For this reason a specially prepared cereal mixture with additions—including a sufficiency of calcium, iron, vitamin A, B_1 and B_2, and D—had been used in his hospital for the last two years. A group of children receiving 2 oz. daily of this special mixture grew much more rapidly than did the control group.

Dr. HELEN MACKAY (London) believed that improving the diet of children offered better prospects of increased health in childhood than almost any other line of approach open to the medical profession. By remedying known dietetic deficiencies resistance to disease could be greatly increased. From observations on infants and young children it was apparent that iron deficiency was very widespread; supply of extra iron to artificially fed babies greatly reduced the incidence of respiratory, gastro-intestinal, and other diseases due to micro-organisms. On the other hand, in a group of infants known to be suffering from vitamin-D deficiency there was increased susceptibility to respiratory infection, but not apparently to gastro-intestinal infections; this diminished resistance could not, however, with certainty be attributed to D deficiency alone, as the diets were not in other respects identical.

Osteomyelitis

A paper on the subject read by Mr. C. P. G. WAKELEY (London) showed the diminished incidence of osteomyelitis during recent years as a result, he believed, of the improved standard of living. He considered that trauma played no important part in its ætiology. Early drainage was essential in treatment. He discussed the surgical treatment of the condition, showing that if a case came to operation early enough the medullary cavity need not be opened. He showed radiographically the excellent result obtained in a case of advanced disease in which diaphysectomy of the tibia followed later by bone grafting had been carried out. His rule was to operate as early as possible on osteomyelitis of bones near the surface, whereas when dealing with early osteomyelitis of the femur he preferred to wait.

SECTION OF PHARMACOLOGY AND THERAPEUTICS

AT a meeting of this section the chair was taken in turn by Prof. R. STOCKMAN, Prof. A. J. CLARK, Prof. V. E. HENDERSON, Vice-Presidents, and Prof. J. A. GUNN, President. Prof. GUNN read a paper on the

Outlook of Research in Therapeutics

For convenience, he said, he would consider research in therapeutics from the three angles of experimental pharmacology, chemotherapy, and experimental therapeutics. Modern medicine had acquired an unwieldy heritage of drugs which had been first tested by direct observation of their effects on disease in man, and there had never yet been any deliberate and concerted plan to rid medicine of the incubus of spurious remedies. Pharmacological research was in many ways inseparable from physiology, but it could not be adequately treated as a mere apanage of physiology. The bulk of pharmacological research could never become specialised, and the pharmacologist must have a wide training in physiological technique, and must at the same time maintain a knowledge of the diseases in which his drugs were used. It would become less and less possible for a man to be both a physiologist and a pharmacologist.

The only possible way of determining the curative value of a drug was to determine its action on the complex of host plus parasite. The reason why the advance in the treatment of trypanosome infections had been so rapid was that they could readily be produced in small laboratory mammals, and their parasites were easily recognised in the blood, so that the course of the infection could be followed. For

chemotherapeutic research it was also necessary to have a potential or reputed remedy, and it was natural that the work should at first have concerned itself with substances which were already known to exert physiological or therapeutic action—i.e., with natural alkaloids or their derivatives. This country was doing little chemotherapeutic research considering the importance of the subject.

The final and crucial test of a drug was its effect on disease in man, and human experimental therapeutics would require the same forethought, skill, and coöperation as did experiments undertaken in pursuit of other sciences. Medical students ought to be taught therapeutics, including practical therepeutic investigation, as thoroughly as they were taught diagnosis or pathology. The experiences of the general practitioner, taken in the aggregate, would greatly assist the advance of practical therapeutics. Teaching implied teachers; yet the University of Edinburgh was the only teaching medical school in this country which had a whole-time chair of therapeutics. The problem of discarding useless remedies would remain as long as new remedies were thrust on the market by drug manufacturers who spent money on investigating new compounds, and had to recoup themselves by the profits on a new drug. A manufacturer could now submit a new drug for the consideration of the Therapeutic Trials Committee of the Medical Research Council, which committee was in a position to arrange for a thorough investigation of the therapeutic merits of the drug. If, as a result, drugs were not in future put on the market without reasonable evidence of their worth, the gain would be great. It would be an advantage to have one large hospital concentrating its main energies on therapeutic research and post-graduate instruction. Some organisation was wanted for sifting and promulgating the knowledge of therapeutics. Medical research was increasing, and new journals continued to appear. A man might spend a good part of a lifetime in reading the literature on quinine alone, and the difficulty of coping even with abstracted literature was becoming increasingly great. Prof. Gunn wondered whether it might not be feasible to establish in every country a bureau of pharmacology and therapeutics which would receive direct from publishers a copy of every paper and book dealing with these subjects. Perhaps it might be combined with laboratories for pharmacology and chemotherapy, a hospital for therapeutic research, and a bureau for sifting and promulgating advances in knowledge. There was an elaborate organisation, with a ministry, for the prevention of disease, but as yet no such organisation for its treatment.

Prof. V. E. HENDERSON agreed on the necessity for academic encouragement, but held that the difficulty was to find a pharmacologist able to teach therapeutics. The effects produced by drugs on experimental animals were often very different from the effects of therapeutic doses in man. Eighty per cent. of the diseases the ordinary practitioner saw were "minor complaints," and yet hardly any extensive investigations were being carried out on them. A physician had recently published a paper identifying 27 different varieties of dyspepsia, but when it came to treatment the differentiation made no difference. Team-work was very necessary in pharmacology. There was always difficulty in keeping patients in hospital long enough for extensive pharmacological experiments with adequate control periods. Inmates of asylums and gaols would be useful material when they suffered from diseases. No new remedy should be sold until it had been adequately tested out in a large institution.

THE SUGGESTION VALUE OF DRUGS

Dr. ROBERT HUTCHISON pointed out that therapeutics was not and perhaps never would be an exact science, nor were drugs the only therapeutic agent. Research in physics, chemistry, and biology, not directed to any therapeutic end, might yield results useful to medicine. One of the greatest necessities was a closer alliance between medicine and other branches of science; unfortunately the whole trend to-day was towards splitting-up and isolation. Intensive ad hoc investigation was not, he suggested, a very fruitful way of advancing therapeutics. He asked whether a drug was necessarily useless because it was inert in a normal animal under experimental conditions. A large part of the use of any drug was due to suggestion. Practising physicians most of the time were not dealing with organic disease. It was just as important to deal with the trivial things, largely of psychological origin, in which anything did good if the patient believed in it. It was not the action of sarsaparilla on the body that mattered, but its action on the mind as a vehicle of auto-suggestion. The only final test of a drug was its effect on patients, and there was room for much more investigation in this respect. The ordinary physician was not such a doddering dement as pharmacologists supposed; but he did find it difficult to regard his patient as the pharmacologist regarded his rat, and to make proper control "experiments." No hospital specially limited to therapeutics would overcome this difficulty, or that due to constitutional variations in patients and in epidemics. Therapeutics ought to be better taught—so ought all subjects in the curriculum—but the only way to effect this was to make it a subject in the final examination. The accumulation of knowledge was a subject urgently needing research; science was being drowned in its own excreta. The multiplication of laboratories and whole-time research workers was not desirable. It did not matter whether a drug was discovered in Germany, the Argentine, or Timbuctoo, so long as it was not kept secret.

Prof. E. MELLANBY protested at the suggestion that therapeutics was being drowned in its own excreta. The subject had made great advances; to cure a disease by a drug was as valuable as to cure it by suggestion. The present stage of medical advance was largely due to therapeutics—to the direct attack on disease. Successful treatment had often elucidated ætiology. In fact, therapeutics was so successful that it was tending to leave physiology behind. Clinical observations which did not lend themselves to experimental inquiry did not, however, advance. Pharmacology gave medicine an unprecedented control over disease and had broken down the absurd barriers between biology, physiology, physics, biochemistry, pathology, and medicine. Neither the physiologist nor the pathologist realised that therapeutics was revolutionising physiology and pathology. Either the pharmacologist must extend his province to include the science of the treatment of disease, becoming the liaison officer between the laboratory and the ward, or he must remain the handmaid of physiology. There must be some better communication between the laboratory and the hospital; not all doctors regarded the laboratory worker with suspicion. The pharmacologist should be in charge of beds. He could greatly reduce the drug bill. He used fewer and cheaper drugs than the practising clinician. He

might not be a great clinician; he must take help from and give it to his colleagues. He should not take fees, his object being solely to discover and investigate. Nor should he devote time to teaching; the work of investigation was very difficult, while teaching was easy, and thus a temptation to the tired worker. The laboratory must come first; ideas from animal experiments could be tested on patients, but fundamental research could not be initiated on them.

Dr. J. H. BURN thought it was quite time that a physician emphasised the psychological importance of drugs, and suggested that a class of "psychological" drugs should be frankly recognised. It might be argued that the doctor must continue to believe in them, but at any rate the very expensive ones might be cut out. He agreed that therapeutics might replace pharmacology in the examination list; much of the present pharmacological teaching was useless. Many things in therapeutics could only be appreciated at the end of the course. A long training was needed before a man could tackle a research job properly, and this training could only be obtained by six or seven years in a laboratory. The progress of the last 25 years was astonishing, and much of it had come from clinical observation. Contact with patients suggested all sorts of things that never occurred to the laboratory worker.

Prof. F. L. PYMAN pleaded for more research in pharmacology, and for close coöperation between the research chemist and the pharmacologist; any promising chemical compound ought to be examined in the pharmacological laboratory from many points of view. A body similar to the Council of Pharmacy and Chemistry of the American Medical Association might be useful here; this body approved a drug before it could be advertised in the journal of the association.

Prof. A. J. CLARK said that he advised his students not to emphasise too much the element of suggestion, as the lusty chiropractor was often more successful than the qualified practitioner in this direction. Great as had been the advances, he wondered if they ought not to have been greater, comparing them, for instance, with the development of wireless, or even of antimalarial therapy in the last three years. Organised team-work on a large scale might detect fine differences between drugs and work up the efficiency of the drugs at our disposal.

Prof. F. R. FRASER defended the practice of requiring research professors to teach and sit on committees; this work widened their views. Help in interfering with disease came from all quarters, but in only a few diseases could real interference be effected as yet, and the pharmacologist could only help the patient to break the process himself. He gave some account of the work of the Therapeutic Trials Committee.

Prof. W. J. DILLING thought that no defence of the experimental method was necessary, and urged the section not to overlook the wealth of research material in municipal hospitals.

Prof. D. CAMPBELL said that researchers were born, not made, yet much could be done to improve them. They should have a sound training in physiological methods, and particularly on the way in which physiological and pathological processes could be modified by physical and chemical means. For this, laboratory training was not sufficient. There was at present very little opportunity for pharmacologists to do therapeutic research; perhaps because authorities did not care to entrust wards to men with no clinical training.

Prof. R. STOCKMAN thought that the general practitioner had brought the treatment of minor ailments almost to perfection and needed very few drugs. Prof. Stockman's attitude to drugs was that of Polonius: "Those friends thou hast, and their adoption tried, grapple them to thy soul with hoops of steel; but do not dull thy soul with entertainment of each new-hatch'd, unfledged comrade." Better training must begin with the student. Most, if not all, of his present text-books could advantageously be discarded; they gave very little real help in therapeutics. It would be good for the pharmacologist to be faced by the hard facts of disease. He must, however, be a man trained in chemistry; doctors, as a whole, were badly trained in the exact sciences.

Prof. GUNN briefly replied, defending the ad hoc experiment.

Dr. J. H. SHELDON read a paper on the

Effect of Copper and Manganese on the Therapeutic Action of Iron

He said that recent work had shown that various metals were widely distributed in human protoplasm. Copper was a universal and essential constituent. Without copper the body was unable to use iron, and manganese was necessary for reproduction. Pure iron could not cure iron-deficiency in rats, but when a little copper was added the anæmia was cured; nothing else would do instead. An obvious application lay in the nutritional anæmia of infants. The human baby seemed to need about 0·5 mg. of copper daily. Young tissues seemed to contain more copper than adult tissues. Copper probably played an important part in growth, and increased the demand for iron. It was therefore desirable to give larger doses of iron with copper. At birth there was a large reserve of copper in the liver; copper and iron were the only metals stored in the liver during fœtal life. The infant depended on this store to prevent nutritional anæmia during its milk-diet period; therefore the mother should be supplied with these metals during pregnancy. The copper content of the liver in eclampsia was very low indeed, and the administration of copper might prevent toxæmia. Human milk was richer in copper and iron than was cow's milk; the copper content of milk could not be increased by feeding the mother with copper. These conclusions could not at present be applied to adult hæmoglobin deficiency.

Manganese was chiefly concentrated in the liver, pancreas, kidneys, and suprarenals, and was found in the blood-serum. No variations had been found in conditions of disease. The liver of the new-born had no reserve store of it; the maximum attained was the normal adult level. Meconium contained a good deal of manganese. In rats lack of manganese had caused a failure of endocrine function, particularly of the reproductive processes. It played no part in the utilisation of iron. All the common preparations of iron contained manganese as an impurity.

Dr. J. F. WILKINSON said that manganese had no value in anæmias, and in most cases his experiments had shown no benefit to accrue from copper alone. These mixed treatments owed their results to the iron; iron alone in adequate doses gave as good results as anything, and only in rare cases could success be attained by smaller doses of iron supplemented with copper. Some patients on iron showed no change for two or three months and then improved suddenly; their use as controls thus vitiated experiments.

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THE LANCET

LONDON: SATURDAY, OCTOBER 1, 1932

VITAMIN-A RESERVES IN THE HUMAN LIVER

A SERIES of four contributions to the study of vitamin A in relation to experimental animals and to man have been published in our columns during the past three weeks, the concluding one, by Dr. H. N. GREEN, appearing in our present issue. The ground was cleared by the convincing demonstration given by L. J. HARRIS and his co-workers [1] confirming conclusions already reached by others that vitamin A has no relation to the general immunising processes of the body; the mistake of attributing to it some influence over these processes is still often made, even by informed persons. The only function performed by vitamin A, which can truly be called an anti-infective one, is the maintenance of the health of the mucous epithelium throughout the body; in vitamin-A deficiency that epithelium becomes keratinised, and its efficiency as a barrier against microbic infection is impaired. This process can be well observed in the rat, particularly when the deficiency is partial so that life is maintained for some time; the relation between deficiency of vitamin A and the keratinisation of the mucous epithelium, with consequent infection, is, in this animal, indisputable. The inference that in man the same process of epithelial deterioration takes place as a result of vitamin-A deficiency, and that a degree of partial deficiency is not infrequent among human beings, is still, however, unproven. The only evidence hitherto available that the reserves of vitamin A in a human population might be too low was provided by the fact that a certain number of cases of well-marked deficiency occurred, from which it was inferred that other cases of partial deficiency must also be present. In this country 17 cases of xerophthalmia and night blindness were seen in the course of one year at the ophthalmological department of a hospital in the North of England [2]; the possibility that a partial deficiency is quite widespread among the poorest classes must therefore be accepted.

The observations made by L. K. WOLFF [3] in Holland and by T. MOORE [4] and GREEN separately in this country now provide data of a more concrete nature. These workers have investigated by means of the antimony trichloride reaction the vitamin-A content of the liver of human beings who for various reasons have come to autopsy; in the series investigated by GREEN all the cases were puerperal. The liver is, as far as we know, the chief storehouse of this vitamin within the body, and its vitamin-A content should give a very good index of the reserves present in it. Such human material is exceedingly difficult to classify. The great variation in the values obtained, even for seemingly comparable individuals within a group, makes it necessary to collect a very large number of results before statistically reliable conclusions can be drawn. Even the observation that great variation exists has value, however, and many other important facts have been elicited. It is noteworthy that both WOLFF and MOORE found the highest values in the livers of diabetics; this is due to the preponderance in their special diet of vegetables containing carotene, the precursor of vitamin A. All other values were markedly below these diabetic ones. An obvious difficulty in such work is the collection of material from normal healthy individuals in order to obtain a normal standard of values. MOORE had at his disposal material from 23 cases of accident or poisoning, and WOLFF had a corresponding series of 78 cases; and though the values in each series showed fairly wide variation, the average values for the two series are substantially the same, and may be regarded as a standard for comparison.

The diseases in which MOORE found that the vitamin-A reserves tended to be low were organic heart disease, non-tuberculous respiratory diseases (particularly bronchitis), organic kidney diseases, septicæmias, and certain septic conditions, but in many other infective conditions the reserves were regarded as adequate. He is therefore forced to the conclusion that the vitamin cannot be regarded as a positive anti-infective agent, indiscriminate in action, but that partial vitamin-A deficiency may be a factor in the ætiology of some types of infection under clinical conditions. WOLFF reckons that about sixteen per cent. of the people of the Netherlands have inadequate vitamin-A reserves, and he adds the interesting observation that these reserves tended to be unduly low in the newly born. GREEN found that the vitamin-A reserves were low in most puerperal cases, and that they might remain low even after large amounts of vitamin A had been administered therapeutically. He gives reasons for believing that this is not due to lack of absorption of vitamin A when taken by the mouth, or to significant loss through urinary excretion, but rather to a failure on the part of the liver cells to incorporate the vitamin when it reaches them in large quantity before it is either destroyed or passes into the general circulation. A new method of approach is being opened by this work. The preliminary findings are suggestive, though, as the authors fully realise, much more relevant material will have to be collected before conclusions of statistical significance can be drawn.

[1] THE LANCET, Sept. 17th, p. 614.
[2] Arch. Dis. Child., 1931, vi., 17.
[3] THE LANCET, Sept. 17th, p. 617.
[4] Ibid., Sept. 24th, p. 669.

HISTORY OF ST. THOMAS'S HOSPITAL

FROM its massive pavilions and its very special advantages of site and frontage St. Thomas's Hospital is to-day perhaps the most imposing of all the great London hospitals, and the story of its past should interest many outside its walls. Fortunately the records have been carefully preserved and the wise and public-spirited action of the treasurer and almoners in having the Hospital Chartulary translated and printed in a slightly abridged form has been followed by a book in which Prof. F. G. PARSONS describes with care and erudition the history of the hospital from the earliest times up to the year 1600.[1]

From the researches of Prof. PARSONS it would seem that St. Thomas's Hospital is a good deal older than its name suggests, and that before BECKET was murdered in 1171 the religious organisation that was to evolve into a hospital named after him cared for the sick in Southwark. The religious house in question was dedicated to St. Mary the Virgin, and was popularly known as the community of St. Mary Overei; it occupied the site of the present church of St. Saviour's, Southwark, and was staffed by Austin canons and canonesses. Prof. PARSONS believes that the infirmary of this institution from which the spital of St. Thomas grew began its work in 1106. He suggests accordingly that RAHERE must have looked carefully into the medical arrangements at St. Mary's Overei before founding St. Bartholomew's in 1123. In both institutions the canons belonged to the Augustinian order, and in both the hospital was subordinated to the Prior. It is interesting to learn that King JOHN, while he tightened this link between the Priory and Hospital of St. Bartholomew's, freed St. Thomas's from all dependence on the Priory of St. Mary. In 1212 a disastrous fire destroyed most of this Priory, and the Bishop of WINCHESTER, in appealing for funds, expressed himself as follows: "Behold, at Southwark an ancient spital built of old to entertain the poor has been entirely reduced to cinders and ashes." Prof. PARSONS tells us that the Bishop knew very well how credulous were the people to whom he was appealing, and that in order to reap an earthly harvest he must first sow heavenly seed; so he gave an indulgence of 20 days to subscribers. As a result ample funds were raised and the hospital was rebuilt on a new site over the road and now dedicated to ST. THOMAS À'BECKET. This skilful bishop was PETER DE RUPIBUS and he had served as a Knight under RICHARD I., so that here we have an early example of successful propaganda by an ex-Service man. He appears to have been one of the very few people always faithful to that much abused monarch King JOHN, and he crowned HENRY III.

Weaned in this way from the mother Priory in 1215, St. Thomas's has had an eventful history during the seven centuries that have since elapsed; the first volume of this history, crowded as it is with events and data illustrating the life of the hospital, only takes us up to 1600. The history will charm all who are interested in old medical foundations, and especially those who have received their medical education in the great hospital dedicated originally to St. Thomas the Martyr, but after the Reformation to St. Thomas the Apostle.

[1] The History of St. Thomas's Hospital. Vol. I. From the Earliest Times Until A.D. 1600. By F. G. Parsons, D.Sc., F.R.C.S., F.S.A. London: Methuen and Co., Ltd. 1932. Pp. 256. 10s. 6d.

THE CHILD'S DEVELOPMENT

A SUMMARY of the existing knowledge of the growth and development of children, with a view to its practical application to the assessment of the normality or abnormality of individual children and to prognosis of their future possibilities has recently been issued by a Committee of the White House Conference on Child Health and Protection.[1] Both mental and physical status are considered; the former occupies twice as much space in the book as the latter, and leaves the impression that the resources available for mental assessment, although far from complete, are already not only more numerous but more useful than those on the physical side. It is, indeed, only in relation to skeletal development that anything suggesting a measured physical scale has been achieved. Medical science has been concentrated upon the abnormal and the diseased, and normal physical development has not received the attention it merits. Psychology, on the other hand, largely through the application of experimental methods, has, in a comparatively short period, attained at least an approximate idea of the normal in mental life and growth. Mental growth is here expressed in changing patterns of behaviour relating to posture, locomotion, prehension, manipulation, language, and adaptive and social behaviour. In most of these both mental and physical factors are involved. A fairly detailed account is given of the "patterns" appropriate to different ages, advancing by months in the first year and by gradually increasing periods later, and tests applicable to ages beyond infancy are fully discussed. Unfortunately, detailed knowledge of these tests is assumed of the reader, which detracts somewhat from the value of the report from the point of view of one seeking enlightenment. In spite of its title it supplies indeed rather an appraisement of materials and methods than practical help for the appraisement of any child. Chapters on the mentally superior, the mentally inferior, parental education, and sex teaching are of interest but do not provide any definitely new or original contribution to our knowledge of these subjects. The concluding section on methods of clinical examination is probably the most valuable section of the report especially to child welfare and school medical officers. Such examination is designed not merely to discover existing abnormality, but to search for indices of development and for preludes to the abnormal.

[1] Growth and Development of the Child. Part IV. Appraisement of the Child. Report of Committee on Growth and Development. London: D. Appleton and Co. 1932. Pp. 344. 15s

The work is essentially a plea for a wider outlook in pædiatrics since, in the committee's words, "infant hygiene cannot be reduced to purely physical terms." Even the primary factors of feeding, sleeping, exercise, rest, metabolism, are forms of "behaviour" and as such find an ultimate reference in personality and infant-parent relationship. The lesson is emphasised by the curious contrast between the discussion of the problem of mothercraft in two books which have recently been submitted to us for review. To take, for example, the sections on weaning, in one [2] the dietary is laid down in detail, and emphasis is laid on the need for gradual weaning in the interests both of the mother and child; but no hint is given that the general upset which may result from a sudden change is not solely due to the ingestion of unaccustomed food on the one side or the painful engorgement of the breast on the other, but has a deep psychological element. Sucking its mother's breast undoubtedly gives the child pleasure, quite apart from the fact that the breast is a source of food; when such contact is denied the child feels aggrieved and needs extra "mothering" and affectionate attention to enable it to readjust its attitude to life. The ways in which this emotional disturbance can be most easily overcome are set out sympathetically in a book designed for mothers [3] which, however, deals purely with the psychological aspect of weaning among other stages in the relation of adult to child, the sole contribution to material considerations being advice to make the first few artificial feeds specially palatable. It is perhaps not desirable that the laywoman should be burdened with psychology and dietetics in the same book, especially as few medical authors are yet qualified to advise on both. But we do look forward to a time when a first-rate text-book on mothercraft designed for the practitioner will not deal almost solely with the physical management of the child. It is true that in Dr. JEWESBURY'S book two pages are allotted to nervousness between notes on alkalosis and tetany, and that encouragement rather than scolding is advised for enuresis, but the emotional aspect of the relation between mother and child is hardly touched. According to the report quoted above, pædiatrics should include a periodic survey not only of health but of "behaviour patterns" if it is to reach an understanding of the child. The authors of the report suggest that the most fruitful line of attack for future research is to be found in extensive study of a relatively small number of children spread over a long period, rather than in the statistical study of masses. Such studies, they think, seldom contribute greatly to the understanding of the individual case. Even more important, in our view, is the teaching of the study of the mental reaction of the child to its environment as an essential part of mothercraft; the series of wireless talks, initiated by Prof. CYRIL BURT on Tuesday evening last, are likely to encourage such study.

[2] Mothercraft: Antenatal and Postnatal. By R. C. Jewesbury, D.M. Oxf. London: J. and A. Churchill. 1932.
[3] New Babes for Old. By Winifred de Kok, M.R.C.S. London: Victor Gollancz. 1932.

ANNOTATIONS

NOTIFICATION OF FOOD POISONING IN LONDON

FOOD poisoning became a compulsorily notifiable disease in London by virtue of Section 7 of the London County Council (General Powers) Act which received the Royal assent last July, at the end of the session. A registered medical practitioner who suspects or becomes aware that a patient is suffering from food poisoning must forthwith notify the district medical officer of health. The notification must take the form of a certificate stating (*a*) the patient's full name, age, and sex, (*b*) the full postal address of the house or premises where the patient is, (*c*) particulars of the food poisoning, and (*d*) a statement whether the case occurs in the notifying practitioner's private practice or in his practice as medical officer of any public body or institution. Failure to notify will involve liability to a penalty not exceeding 40*s*. The practitioner is entitled to a fee for the certificate, 2*s*. 6*d*. if the case occurs in his private practice, 1*s*. otherwise. The section is slightly more elaborate than previous precedents elsewhere. Hitherto, in areas where food poisoning has been made compulsorily notifiable under local act, it has not been usual for Parliament to require notification by certificate or to insist upon more information than the mere name and address of the patient. Clauses of the usual type occur in the local Acts obtained in the current session by both Rochdale and Bury. The provision is not novel. A rapid glance through the local legislation of the post-war years reveals six instances of compulsory notification of food poisoning in the Acts of the session 1930–31, 11 in those of 1929–30, 4 in 1929, 10 in 1928, 3 in 1927, 1 in 1926 (Guildford), and 1 in 1924 (Wakefield). Presumably the search must be prolonged still further back in order to discover the local authority which has the credit of having originated the clause; presently, no doubt, the clause will find its way into a public health act applicable to the whole country. Meanwhile, its operation in the metropolitan area gives opportunity of large-scale trial. Prompt pooling of information as to food poisoning outbreaks (with particulars of their nature) will enable warnings to be circulated to medical officers who have the care of an enormous population. The clause in the recent London Act not only amplifies the information required; it also adds two further subsections. One of them enacts that, if there are two or more medical officers in a district, the certificate must be sent to the officer who has charge of the area in which the patient is, or to such other of the officers as the sanitary authority may direct. The other new subsection provides that certificates may be sent to the medical officer either at his office or at his residence. In addition there is a consequential application of Section 57 of the Public Health (London) Act of 1891 to ensure that the receipt of a fee by a medical practitioner for the notification of food poisoning shall not disqualify him from membership of the county council or of a sanitary authority, or from service in any other public office.

URINARY TRACT CHANGES IN PREGNANCY AND PUERPERIUM

NUMEROUS recent studies have demonstrated the anatomical changes which normally and abnormally occur in the urinary tract in pregnancy and the puerperium. Most of these examinations were carried out on post-mortem material or on the living subject by means of retrograde pyelography. The more recent introduction of intravenous pyelography has opened up a new method of approach to a difficult subject. William F. Mengert and Harry P. Lee[1] have lately used the method on 41 pregnant women, 20 primiparæ and 21 multiparæ. In order to establish an index of the amount and frequency of urinary tract dilatations, and as a basis for judging postpartum changes, the first radiograms were made during late pregnancy, and further exposures, usually three or four, were obtained during the fortnight following delivery. Stereoradiograms were taken in all cases, lest a single film, if it happened to be taken during a peristaltic contraction, might not represent the true size of the ureter. The antepartum pictures were taken from 1 to 65 days before the onset of labour. In all the primiparæ dilatation of some degree was present on the right side in calyces, pelvis, and ureter; on the left side it was found in about 90 per cent. of the cases. Dilatation of marked degree was three or four times as frequent on the right side as on the left, and it was encountered more often in primiparæ than in multiparæ. As to postpartum involution of the urinary tract, in eight cases a marked reduction in the extent of the dilatation was observed within 24 hours, while in 9 to 11 days after delivery all dilatation had disappeared in the majority of the normal patients examined. The involution of the urinary tract was, on the whole, slower in primiparæ; and was noticeably slower, too, in the presence of infection. It is suggested that this delayed involution may be a factor in the development of postpartum pyelitis. This assumption is not unreasonable in view of the important part played by dilatation of the ureter in predisposing a patient to antepartum pyelitis. It is probably true that antepartum pyelitis would never occur if the ureters were normal. Why they should become so often dilated during pregnancy is still a controversial question, and even more perhaps why the dilatation should be more frequent on the right side than on the left.

STREET MARKETS

IN the wide spaces of the country town market day with its bustle and spirit of holiday is a pleasant sight; in the narrow crowded streets of the metropolis certain disadvantages intrude upon the notice. The street markets of the East End have been likened to Oriental bazaars where the merchants expose for sale in the open anything from carpets to dates and drinking water. Councillor C. Bennett, at the recent Belfast Congress of the Royal Institute of Public Health, described the Bethnal Green Sunday morning "junk" market as providing a feast of horrors for the conscientious sanitarian. Old mattresses and furniture are interspersed with second-hand (or worse) clothing; boot stalls are side by side with barrows where apple fritters are being cooked in the open; slices of tinned pineapple, cakes, sweets, even sliced melon and cut oranges are exposed for sale alongside old hot-water bottles and gum boots. In one of the markets live-stock such as pigeons, canaries, geese, rabbits, guinea-pigs, and tortoises are sold side by side with foodstuffs. The traders pay little attention to the disposal of the refuse; at the end of the day shells, fish scales, feathers, decayed oranges, cabbage leaves, and wilted flowers are scattered over the roadway, eluding the provision by the borough council of receptacles for their storage. Nutrient agar plates exposed in several street markets grew colon bacilli and coarse streptococci of the salivarius and fæcalis types in addition to the moulds and saprophytes of quieter streets. Remedies are hard to apply in the face of the conservatism of Bethnal Green people. The vested interests of the market monopolies unfortunately prevented the use of Columbia market for the purpose for which the late Baroness Burdett-Coutts, with tremendous generosity, intended it. Councillor Bennett suggests that the stalls selling the more easily contaminated foodstuffs should be placed on a special site. Certainly every stall in the markets should be screened, and any on which foodstuffs are exposed should be completely enclosed, however much this may conflict with the conservatism of the public and with the wishes of the traders themselves.

THE CHILDREN OF MENTAL DEFECTIVES

SPECIFIC information about the mental state of families of mentally defectives is timely. The figures given in the annual report of the special school after-care subcommittee of Birmingham concerning the offspring of ex-pupils of the special schools are as follows: 1183 children were born into 602 families. In 312 of these families the father was an ex-pupil and in 290 the mother, the latter group including 38 illegitimate children born to defective mothers; 101 of the children are dead and many are under 5 years of age and thus did not come under observation; of the 494 children over 5 years old who had one defective parent 16 are definitely mentally defective—i.e., 3·24 per cent. This figure, however, certainly under estimates the true proportion of defective children, since systematic examinations for the admission of children to special schools do not begin until the ages of 7 or 8. It would be valuable to ascertain the number of children above 8 years of age, and also the number who are not attending elementary schools. But even if every allowance is made for cases not ascertained, it seems improbable that the numbers would be swelled to as much as double the figures given, and if this should prove to be a fair deduction the proportion of mentally defective children in this group would not exceed 5 per cent. This does not, of course, preclude the possibility that some of the children may be "carriers" of defect, and that a larger proportion of the grandchildren of the ex-pupils would be defective. But as far as they go the figures from Birmingham suggest that the prevention of propagation by defectives would not seriously reduce the number of the mentally defective in the next generation. The subcommittee hold that the evidence so far collected tends to disprove the popular idea that the mentally defective are abnormally prolific. A very different picture however is given by Dr. A. G. Morison in a study of 84 mental defectives published in our issue of Sept. 10th (p. 589). Of these children 23 belong to lower grades and 61 to higher grades of defectiveness. Of the 23 lower-grade children 5 had parents, one of whom was feeble-minded; of the 61 higher-grade children 15 had parents, one or both of whom were feeble-minded.

[1] Amer. Jour. Obst. and Gynec., August, 1932

It would thus appear that 20 of the 84 children examined by Dr. Morison had one (18 cases) or two (2 cases) defective parents. A reduction of 24 per cent. in the incidence of defectiveness could therefore have been effected in this series by preventing the propagation of the defective parents. The discrepancy between these two sets of findings points to the necessity of further research, and it is gratifying to note that the heredity of mental defectiveness is one of the subjects that is to be considered by the Departmental Committee recently appointed by the Minister of Health to inquire into the value of sterilisation as a preventive measure.

SUBJECTIVE SENSATIONS

IT is the common experience of most to suffer at one time or another from such sensations as tingling, pins and needles, burning, or coldness. The mechanism of their production has been studied by U. Ebbecke [1] and others, and has recently been the subject of investigation by Sir Thomas Lewis and his associates.[2] Following constriction of a limb sufficient to stop circulation, tingling and allied sensations are soon felt at the periphery of the limb; gradually the parasthesiæ creep proximally towards the constricting band. If, however, at the onset of these sensations a constricting band is placed distal to the original one and the latter released, the tingling disappears. From experiments of this kind it has become evident that the tingling could not be dependent upon changes at the periphery, but must be the result of changes in the nerves underlying the constricting band; in other words, the tingling arose from changes not at the periphery but proximally at the site of constriction. H. C. Bazett and B. McGlone,[3] working on the sensations of cold and heat experienced immediately following the release of constriction, have brought forward evidence favouring their production by biochemical products elaborated during stasis of the blood. With sensitive thermocouples buried in the skin at varying levels, they determined the actual temperature of the tissues during the conscious feeling of cold and heat as above produced. Release of the blood flow with the arm bathed in water at body temperature gave rise to marked sensations of heat, but caused no alteration of temperature in the tissues of sufficient magnitude to account for the sensation experienced. These experiments, elaborated in various ways, led Bazett and McGlone to the deduction that the sensations were dependent upon the action of some biochemical factor upon the temperature nerve-endings. Alteration of the temperature of the arm and of the duration of constriction caused variation in the intensity and character of the sensations, and it appeared that the sensation was roughly associated with the probable acidity of the blood flowing into the dermal area previously rendered stagnant. Further weight is added to this deduction by the demonstration of the greater intensity of the sensations following stasis in the arm than of those following stasis limited to a finger; this observation is regarded as favouring the production of a chemical substance derived from the metabolic processes in muscle tissue during stasis. In this way the work becomes closely linked with that of Lewis upon the pain associated with intermittent claudication. Of great interest is the evidence, produced by various observers, that the sensation of pain, heat, and cold may be separately produced by chemical factors; whether there is a chemical link between stimulation of the normal skin and impulses arising in the sensory nerve-endings remains a problem of the future.

[1] Arch. f. d. ges. Physiol., 1917, clxix., 395.
[2] Heart, 1931, xvi., 1.
[3] Arch. Neurol. and Psychiat., 1932, xxviii., 71.

THE DEVONSHIRE COLIC

IN 1617 Citois claimed that bad wine which had been treated with lead was a cause of colic among the Pictones or inhabitants of Poictou. This colica Pictonum he described excellently, but he attributed the disturbance chiefly to the acid of the wine. Late in the seventeenth century colic and paralysis following the addition of litharge to wine became notorious. Indeed, in 1696, the Duke of Würtemberg was so impressed with the danger of this practice that he issued a decree making it a capital crime. About this time colic became prevalent among cider-drinkers in Devonshire, but it was many years before lead was proved to be the cause. In 1703 Musgrave stated that the colic in Devonshire, sometimes associated with paralysis, was caused by the excessive use of crude cider which was too acid. Huxham, in 1752, described the colicky pains and paralysis in vivid fashion. He expressed his conviction that the Devonshire colic was due to the tartar extracted from the apples in the process of making cider. It was Sir George Baker, himself a Devonshire man, who first followed up the analogy between lead colic and the Devonshire colic (1767). He finally proved his point conclusively by demonstrating that the cider of Devonshire contained lead, while that of Herefordshire did not. He showed, further, that in Devonshire, but not in Herefordshire, it was a common practice to line the cider presses with lead. He also exposed the practice of adding metallic lead, litharge, or lead acetate for the purpose of correcting sour cider. His investigations created a great storm, and he was denounced as a traitor to his county. Although colic due to the employment of lead in the manufacture and storage of cider has now disappeared, minor outbreaks of plumbism due to cider-drinking still occur from time to time. It is of interest that Dr. and Mrs. L. N. Jackson should have discovered that lead colic is still endemic in Devonshire amongst cider-drinkers, though from a different cause. In a paper in our present issue they describe ten patients with lead colic, frequenting eleven public-houses in a Devonshire town. In six of these houses they found lead in the cider as drawn by the bar engine, though samples from the cask were in all cases free from lead. In these days when public-houses are subjected to so many restrictions, designed to protect the public, it is curious that they should be allowed to continue to use lead pipes to convey cider or beer from cask to bar engine.

THE PREVENTION OF POST-VACCINAL ENCEPHALITIS

IN the absence of precise knowledge of the ætiology of post-vaccinal encephalitis any suggestion as to its prevention, however slenderly based, is worthy of notice. The observation made by the New York Poliomyelitis Commission, 1916—that among 954 poliomyelitis patients, 1 to 4 years of age, the attack-rate among the Schick-positive was six to seven times as high as among the Schick-negative children—has recently been recalled in another connexion. In a recent issue [1] of the public health reports of the U S.

[1] Public Health Reports, 1932, xlvii., 1553.

Treasury Department, Dr. Charles Armstrong summarises what is known of post-vaccinal encephalitis and its prevention, and suggests that collateral immunity against other diseases may carry with it a certain resistance to this grave, if very rare, complication of vaccinia. Certain experiments were devised to test the hypothesis, using a strain of vaccinia developed some years ago by Rosenau and Andervont, which produced a fatal meningo-encephalitis when injected intracerebrally into white mice. A dose of this virus was selected which was slightly less than that sufficient to kill all of a group of normal mice, and the effect of this dose was compared on groups of normal mice and in mice which had been previously immunised with diphtheria toxoid. At the end of 25 days the survivals in the normal group were 12 per cent., while in the immunised group they were 27 per cent. Previous immunisation to diphtheria toxoid thus appeared to turn the scales against the incidence of cerebral complications occurring in mice. Dr. Armstrong admits that the protection of a few mice from a cerebral virus infection by means of a previous non-specific stimulation of the defence mechanism does not necessarily lead to the conclusion that children could be similarly protected from post-vaccinal encephalitis, but in the absence of any other method of protection the suggestion arising from Dr. Armstrong's experiments might be followed up. He proposes that primary vaccinations, especially after the first year of life, should be deferred until immunisation against diphtheria or other diseases by means of inanimate antigens has been accomplished. Such a definite recommendation coming from a highly expert official is worth considering by those who have to face a delicate problem in administrative hygiene. Immunologists rightly hold fast to the strictly specific view of immunity upon which all that is most solid in their science is based, but "practice makes perfect" is a biological law of wide application, and it may well be that a preliminary exercise with one antigen somehow teaches the organism how to deal with others far removed in the scale of specificity.

THE BRIGHTER SIDE OF EPILEPSY

IT is common knowledge that there are more epileptics outside institutions than inside, and that much, if not most, of the published work on epilepsy has been done in institutions. Epilepsy, in this respect, shares the lot of other diseases in that the clinical and scientific aspect of the serious cases which get inside hospital wards or institutions tends to become the text-book picture, often with a darker outlook than would be given by the experienced general practitioner. Naturally, it is the milder cases, with few fits and little mental deterioration or abnormality, which are found outside institutions, and of these Dr. H. A. Paskind, of Chicago,[1] gives a more hopeful outlook than that generally held. His paper is a study of the after-history of 304 epileptics who had had the disease for six years or more, many of them having suffered for periods up to 20, 30, or 40 years, or even longer. In this survey only 20 patients, or 6·5 per cent., were found to have deteriorated mentally, the whole of the remaining 93·5 per cent. being in excellent mental health, without the slightest trace of deterioration or other psychosis, and engaged in occupations similar to those of the great mass of the population. Such few cases of deterioration as were found were not more frequent among those who had the disease for a very long time. Dr. Paskind compares these extramural cases of epilepsy, as he terms them, with institutional patients, and finds, as one would expect, that his cases have very much fewer attacks, both of major and minor type, and that periods of freedom from fits are more frequent and last longer. The age of onset was on the average markedly later, about a third of the cases not having their first fit until after their twenty-fifth birthday. Among the families of the extramural patients, epilepsy, psychoses, alcoholism, and other manifestations of the neuropathic heredity, except migraine and so-called nervousness, were far less common than among those of institutional patients. It would require other surveys of records in private practice before Dr. Paskind's picture can be taken as typical; but it should at least encourage those who have epileptics under their care to combat the lack of incentive and of competition that induces the progressive narrowing of mental horizon generally considered typical of epilepsy.

[1] Arch. of Neur. and Psych., August, 1932, p. 370.

LOCALISATION OF CEREBRAL TUMOURS

IT is disappointing that increased knowledge of the physiology of the central nervous system has as yet brought little help in the localisation of cerebral tumours. Neurologists and neuro-surgeons continue to find regional diagnosis very difficult. The introduction of ventriculography by W. E. Dandy some years ago appeared to offer hope of a considerable advance in accuracy. The value of this technique has recently been assessed by A. W. Adson[1] and F. C. Grant,[2] who have published separately the results of an extensive trial of this method. Both have used two procedures, (1) direct filling of the ventricles with air, and (2) the replacement of the cerebro-spinal fluid with air via the lumbar route; this method permits air to pass not only into the ventricle but also over the surface of the brain. Following direct ventriculography, a study of the X ray appearances of the outline of the ventricles in varying positions of the head frequently offers help. The internal hydrocephalus associated with tumours situated in the posterior fossa, the distortion of one or both anterior horns associated with frontal tumours, and the alteration in the outline of the lateral ventricles associated with temporal lobe tumours are well recognised. But the real value of this technique can be assessed only by a consideration of the results obtained in tumours not localisable after a careful neurological examination. Adson found that this method gave positive localising evidence in 23 per cent. of cases not localised clinically; Grant found it successful in 21 out of 48 cases without localising signs. Both observers have thus been able to reduce the number of cases in which they would have hesitated to operate. On the other hand, the technique is by no means safe; fatalities are recorded averaging about 6 per cent. This percentage must of course be considered with due regard to the bad prognosis in cerebral tumours which cannot be located for operation. Encephalography, a simpler procedure than direct ventriculography, is also less useful; it is contra-indicated in cases of increased intracranial pressure, especially in tumours situated in the posterior fossa. It may, however, give help in the differential diagnosis of varying conditions involving the cortex, such as cortical atrophy, traumatic lesions, and vascular disturbances. It is

[1] Amer. Jour. of Roentgenology, 1932, xxvii., 657.
[2] Arch. of Neurology and Psychiatry, 1932, xxvii., 1310.

almost unnecessary to add that such measures cannot replace careful neurological examination, and should be used only in difficult cases and by men experienced in the technique.

THE MEIBOMIAN DUCTS

THE small operation for incision and evacuation of a chalazion is, as a rule, a simple matter, but occasionally, when they are multiple or become inflamed, or when they are recurrent, as they frequently are, they may become a very tiresome infliction, involving the necessity of several minor operations or causing an acute conjunctivitis which, in a severe case, may even simulate acute trachoma. The best way of handling these cases—and what is of even greater importance, of preventing their occurrence—is clearly stated in an article by Dr. Arthur Eppenstein, of Berlin,[1] which, since the method of prophylaxis is easy, should specially appeal to the general practitioner. The openings of the Meibomian glands appear normally as minute depressions in the margin of the upper eyelid, and the normal secretion is a tiny clear drop. Excessive secretion indicates the beginning of something wrong, and if it is mucoid or muco-purulent, or if a yellowish-white substance such as is seen in seborrhœa of the scalp is deposited at the openings of the ducts on the lid margin, the indication is to evacuate the duct, not by means of an incision but by pressure, applied preferably by means of a small glass rod inside the lid and a finger-nail outside which must follow the line of the duct from fornix to lid margin. This may have to be repeated several times, but if the ducts can be kept clear by this means it will probably prevent the more annoying complications from developing. Not only will this procedure be found useful in cases of recurring chalazion, but many cases of chronic conjunctivitis and blepharitis, obstinate to ordinary treatment, will rapidly improve when attention is directed to Meibomian ducts. For the operating surgeon, too, as Dr. Eppenstein remarks, it is of importance when preparing the lids before an intra-ocular incision, not to forget that the Meibomian ducts may be just as dangerous a source of infection as the lacrymal sac.

AMBULANT PHRENICECTOMY

AVULSION of the phrenic nerve to immobilise the diaphragm has been recommended chiefly as a supplement to artificial pneumothorax and thoracoplastic operations. The thesis that it may be an independent substitute for an artificial pneumothorax is presented in *Acta Medica Scandinavica* (vol. lxxviii., fasc. ii., 1932) by Dr. N. Oekonomopoulo of Athens. With an experience of 160 cases of pulmonary tuberculosis, treated by phrenic avulsion under ambulant conditions, he answers in the affirmative his own question: Can the artificial paralysis of the diaphragm be justifiably regarded as an independent operation in the treatment of pulmonary tuberculosis? He has kept 125 patients under continuous clinical and radiological control for periods up to four years; among them there were 33 who improved, and 40 who achieved a clinical recovery. Many of these 73 patients, who benefited from phrenic avulsion, had previously spent months and even years in seeking health by such conservative means as sanatorium treatment. Among the 125 were 71 in whom an artificial pneumothorax might have been induced; improvement was achieved in 19 of these cases and clinical recovery in 31—a result which Dr. Oekonomopoulo suggests would compare favourably with those which an artificial pneumothorax might have yielded. In his choice of subjects suitable for one or other operation, he tends to allot the comparatively early and limited lesions to phrenic avulsion, and the more serious cases to an artificial pneumothorax. Cases of *Frühinfiltrat*, for example, he regards as suitable for phrenic avulsion, the effects of which are prompt, whereas an artificial pneumothorax, which is also justifiable in such cases, must be maintained for 6 to 12 months. In our present issue (p. 767) Mr. L. O'Shaughnessy describes his experience when working in the Sudan of 58 cases of pulmonary disease, for the most part tubercle, treated by phrenicectomy, which the primitive conditions led him to prefer to other forms of collapse therapy. The material was in no way selected, as even in the worst cases he hoped to obtain for the patient some relief of symptoms. The results as a whole, he says, were not encouraging, although in several cases there was a restoration to normal health for a year or more before the inevitable relapse. Mr. O'Shaughnessy suggests that the chief value of phrenicectomy as an individual measure may be found in cases whose balance has just not been tilted towards health by the ordinary methods of rest and diet. It may have a subsidiary function in the relief of symptoms caused by adhesions in the region of the diaphragm. Though phrenic avulsion requires considerable surgical skill, it is yet a simple operation, entailing little risk of immediate or late complications. An operation which requires no prolonged institutional treatment has, of course, a distinct advantage over one that implies months of residence in a hospital or sanatorium; and this has particular point in communities with a high tuberculosis-rate and little institutional accommodation.

THE RULES OF DEATH CERTIFICATION

A MONTH or two ago we published a letter [1] criticising the rules drawn up by the Registrar-General for primary tabulation when joint causes of death are stated on the certificate and we were then in a position to assure our readers that it is the definite policy of the General Register Office to rely upon the information of the certificate rather than upon arbitrary rules, the hindrance to giving effect to this policy being the failure of the medical profession so far to make extended use of the new form of death certificate, a form expressly designed to make it easier for the certifying practitioner to provide the Registrar-General with the information he needs. In our correspondence columns this week Dr. G. Sowden, medical officer of health for St. Pancras, expresses a doubt if the desirable practice mentioned in our leading article of August 20th (p. 405) is really adopted by the General Register Office. "In my experience," he writes, "I have found that the application of the rule of selection is invariably followed, and any disease in a lower group is preferred to one in a higher, notwithstanding the opinion of the certifying practitioner," and he cites an instance in which he was informed by the Registrar-General that the cause of death was to be classified to tuberculosis, although the immediate cause was certified as diabetic coma. The certifying practitioner, it seems, stated that tuberculosis was discovered owing to a post-mortem examination, and that the

[1] Deut. med. Woch., August 12th, p. 1283.

[1] THE LANCET, August 20th, p. 419.

immediate cause of death was diabetic coma. Dr. Sowden regarded that statement as indicating in the mind of the practitioner that tuberculosis had little if anything to do with the death and was only ascertained incidentally; it certainly was not the morbid condition which gave rise to the diabetic coma, and yet, he complains, tuberculosis is the cause selected by the rules of the General Register Office. To put it another way, if the post-mortem examination had not been made, the practitioner would probably have certified "Diabetic coma—Diabetes," and the cause would have been accurately recorded. We gladly publish Dr. Sowden's letter because it reveals a difficulty, which seems to be widely felt, of interpreting the present form of the death certificate and the annotations accompanying it. If attention is paid to the form of this certificate it must however be clear that, if the practitioner assigns diabetic coma as the immediate cause of death, the death would not be tabulated to diabetic coma, because "immediate" is specifically stated to be immediate in point of time. The Registrar-General might say very justly: "If you look at the official form you will see that the practitioner certified that the immediate cause of death was diabetic coma *due to* pulmonary tuberculosis. In other words, he certified that the real cause of death was the tuberculosis, although it reached its fatal termination by the instrumentality of the diabetic condition. By his certificate he made it clear that the immediate cause in his opinion was not the causa causans but merely an intermediate link in the chain between the real antecedent cause of tuberculosis and the death itself." The General Register Office has put up a hard fight to keep out of certificates "causes" which are merely terminal modes of exit; it does not want to classify by subordinate links in the chain of causation from the real cause to its fatal outcome. In cases where a long chain of antecedent causation is certified, some question might arise as to where the chain is to be cut for the purposes of classification; but no such question arises here. Had the practitioner intended to signify that the two causes were of independent origin and that the tuberculosis had merely a contributory and collateral bearing upon a death ensuing from the diabetic condition or its direct consequences, he would (or should) have used paragraph II. on the form.

AN ENDOWMENT OF CLINICAL RESEARCH

THE Rockefeller Foundation has handed over to University College Hospital, London, the sum of £48,800 "to constitute a fund for the permanent endowment of a post, the holder of which will devote his whole energies to the advancement of clinical research." The gift is made with a view to encouraging the progress of clinical research on lines which the Medical Research Council has been developing in conjunction with University College Hospital Medical School since 1916. The idea underlying the scheme is that there should be brought into existence a body of workers, free from ordinary hospital routine and teaching, who would devote their whole time to the investigation of special clinical problems. Since 1916 the Medical Research Council has financed such a body of workers under the guidance of Sir Thomas Lewis at University College Hospital, and in 1930 the hospital formally recognised this group as a definite Department of Clinical Research. It is thus fitting that the post endowed should be the one at present held by Sir Thomas Lewis as physician-in-charge of this department. This magnificent gift will release sufficient funds to enable the Medical Research Council to make provision for further posts of the same nature, and so to give younger workers the possible prospect of a life devoted to the scientific study of clinical problems unhindered by the distractions of consulting practice or by the distance from human patients which posts in physiology or pathology enforce. The establishment of posts for clinical research should help to resolve the divergence of outlook between laboratory and clinical workers which is clearly demonstrated in the discussion reported on p. 740, and bring about the closer alliance between medicine and other branches of science which Dr. Hutchison noted as one of the great needs of the day. The Rockefeller gift is entirely educational in scope and will in no way relieve any hospital thus endowed of the burden of raising funds for charitable purposes.

FAMILY PREDISPOSITION TO URINARY CALCULI

VERY little has been recorded about the heredity factor in the formation of calculi. The French, it is true, have created the term "diathèse oxalurique," but the appearance of oxalic acid crystals in the urine does not necessarily imply, although it may favour, the formation of calculi. Dr. H. C. Gram belongs to a family in which a predisposition to calculus formation seems to exist, and has recently published [1] the results of a study on oxalic urinary calculi from the point of view of heredity. In members of five generations observed there occurred with great frequency stones which were found on analysis to consist of oxalate of calcium. The trouble was noted only in males; this is in harmony with R. McCarrison's report on 34,325 Indian cases of calculus, in which the ratio of male cases to female was as 13·2 to 1. It is not easy to find an explanation for this high relative incidence of calculi amongst males. The long urethra and the common occurrence of prostatic obstruction amongst the elderly may suffice to explain the greater frequency of vesical calculi in men, but can have no bearing on the higher proportion of renal calculus amongst younger men. As regards the heredity factor, Dr. Gram admits that his investigation concerns only one family, and does not prove that stone formation always shows a hereditary disposition; but it confirms the general impression that a tendency to calculi, as to gout, may be a familial characteristic.

THE Royal College of Physicians of London will commemorate its benefactors on Tuesday, Oct. 18th, when the Harveian Oration on the Debt of Preventive Medicine to Harvey and to the College will be delivered by Sir George Newman at 4 P.M. The commemoration dinner will be held in the College on the same evening, and the annual sermon, re-established under the scheme of the Charity Commissioners for the administration of the Sadleir Trust, will be preached at the Mercers' Chapel, Ironmonger-lane, Cheapside, at noon on Oct. 18th, being St. Luke's Day.

ON Thursday next, Oct. 6th, at 3.30 P.M., a memorial to the late Sir Andrew Balfour will be unveiled at the London School of Hygiene and Tropical Medicine by the Earl of Athlone, Chancellor of the University of London.

Summer Time, which commenced in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday, April 17th, will cease on Sunday next, Oct. 2nd, at 3 A.M., when the clock will be put back to 2 A.M. The hour 2–3 A.M. Summer Time will thus be followed by the hour 2–3 A.M. Greenwich time.

[1] Acta Med. Scandinavica, 1932, lxxviii., 268.

POST-GRADUATE LECTURES

At the beginning of this winter session lectures and demonstrations to old students and other graduates are again being given at many of the London teaching hospitals. The following are summaries of three lectures delivered at Westminster Hospital in a course, held under the auspices of the Fellowship of Medicine.

THE INOPERABLE CANCER PATIENT

(Mr. Stanford Cade)

Of all cases of cancer seen in hospital only 20 per cent. are operable.[1] If this statement is correct it means that 80 per cent. of cancer patients when first seen are incurable by surgery. If one adds to their number the cases of post-operative recurrence—by no means a small proportion—it becomes obvious that the problem presented by this group of patients is as great as it is depressing.

It is to be hoped that a time will come when to-day's means of alleviation and treatment will all be measures of the past, swept into oblivion by some specific medicinal remedy. In the meantime what have we to offer to the non-operable patient? Above all, an attitude of helplessness and hopelessness, not infrequently adopted by both doctor and relatives, must be condemned. Certain therapeutic procedures, whether curative or palliative, should receive due attention, since they can without doubt increase the patient's happiness and comfort.

Physical agents.—So long as the action of radium and X rays on living cells is not understood, treatment by radiation remains empirical. If to this is added the fact that measurement of the quantities of energy received by the tissues presents the greatest difficulty, it is not surprising that radiation therapy has so far undergone successive periods of unjustifiable enthusiasm and depression. Nevertheless, as used by experts in institutions where team-work is understood and practised, X rays and radium have to-day no rivals in the treatment of malignant disease. The choice between them, or the combination of methods, depends upon the type of cancer, its situation and extent, and upon the general condition of the patient. The results to be expected can be summarised as follows:—

In inoperable carcinoma of the *uterus* arrest of hæmorrhage, diminution of discharge, and healing of ulceration, are usually obtained for periods varying from a few months to five to ten years or more in cases of apparent cure. The methods of irradiation by radium, X rays, or by combined treatment are simple and present no great technical difficulty or risk. For inoperable cancer of the *mouth* and *tongue*, my own figures, based upon 350 cases, show five-year survival in 11 per cent., healing of primary lesion in 85 per cent., local recurrence in 20 per cent. For periods varying from one to three years the disease appears arrested, healing occurs, and there is an amount of palliation which can only be fully appreciated if one is in constant touch with the patients. No lesion in the mouth is too advanced to be relieved in some measure by careful radiation. Death as a rule is caused by invasion of the lymphatics. Post-radiation pain, sepsis, neuritis, and necrosis can be avoided by accurate treatment, efficient screenage, and appreciation of the dose to be given. In inoperable carcinoma of the *breast* temporary retrogression of the disease and healing of ulceration takes place in 70 per cent. of cases. Death is usually the result of visceral metastasis, with a minimum of external evidence of the disease. In cancer of the *rectum* and *œsophagus*, however, treatment by radiation offers very little and can be considered purely experimental.

Daily observation of patients during the past eight years has convinced me that by physical agents palliation is obtained in the vast majority of cases, that such palliation is well worth offering to the patient, that apparent restoration to health and return to normal occupation is more commonly seen than is generally believed possible. The following few cases will serve to illustrate the palliative results of radiation treatment.

(*a*) Carcinoma of both breasts, numerous cutaneous ulcerative lesions, and wide lymphatic dissemination, in a patient aged 50. Radiation has enabled her to resume her occupation as a saleswoman with a firm of surgical instrument-makers. I have no doubt that many a surgeon, sceptical as to the value of radiation, has been served by this patient.

(*b*) Extensive local recurrence following perineal excision of the rectum. This patient was treated with radium in 1928, and sufficient palliation was obtained to enable him to travel to India every year and follow his occupation.

(*c*) Inoperable carcinoma of the tongue, with secondary deposits in the cervical glands. Radium has produced complete retrogression of the disease, enabling the patient to follow his occupation as solicitor's clerk for the past six years.

As no surgical acumen or clinical experience can forecast the result of radiation treatment, it is always to the benefit of the patient to receive such treatment.

Chemical agents.—It would be simpler to enumerate the metallic substances which have *not* been tried at some time or another in the treatment of malignant disease than to give a list of the metals which are supposed to have cancerocidal properties. Arsenic, bismuth, gold, lead, selenium, and uranium have had the longest trial. Of them all there is only one substance which need claim our attention, *lead selenide*, as introduced by A. T. Todd of Bristol. It is free from the slightest hint of "patent medicine," is obtainable at a very small cost, and can be given with safety by the patient's private doctor. In small doses (1 to 3 c.cm.) it definitely relieves pain and diminishes cachexia. In a few undoubted cases it has led to marked retrogression of the disease for periods of a few months to two years.

Biochemical agents.—Adrenaline, pituitrin, theelin, and some sera have all from time to time received publicity as cancer remedies. Recently an extract of parathyroid gland has been endowed with similar qualities. No confirmation of the original work is yet forthcoming. These substances need not claim the clinician's attention; they are so far of interest only in laboratory experiments. No doubt some have growth-restraining properties, but it is unfortunate that "growth" and "tumour formation" should be considered as synonymous.

Non-specific medicinal treatment.—In the treatment of the inoperable cancer patient much can be done in addition to radiation therapy by the following means:—(*a*) Blood transfusion is valuable as a preradiation measure if the blood count shows a fall of red cells to under 3,000,000. (*b*) General heliotherapy, with the exception of the affected area. (*c*) Administration of iron, calcium, vitamins, and liver extract. (*d*) Small doses of cocaine are occasionally

[1] Wood, F. Carter: Radiology, 1931, xvi., 291.

of great benefit. (*e*) Abstention from morphia for as long as possible. Relief of pain can be obtained by a host of non-opium preparations which are preferable and which enable the patient to carry on his occupation.

In conclusion, it must be always kept in mind that in treating inoperable patients, the clinician must abstain from remedies which are "heroic" in nature. The mortality of the disease must not blind us to the mortality of the treatment. The inoperable cancer patient has a right to have his life prolonged, and this must be achieved at less price than that paid by numerous "operable" patients who stake all and lose all in the surgical act.

INJURIES OF THE ELBOW-JOINT

(MR. E. P. BROCKMAN)

THERE are certain principles which must be followed in the treatment of all injuries of the elbow-joint, and they are very well illustrated in the treatment of a *supracondylar fracture*. This results from falls on the outstretched hand or from direct violence. The line of fracture runs through the metaphysis close to the epiphyseal cartilage and the epiphysis may be displaced backwards and upwards, the degree of such displacement varying according to the severity of the accident. The child presents itself with a painful swollen elbow, the swelling having come up very rapidly. In order to obtain a good functional result early reduction of this fracture is essential. Under an anæsthetic the arm must be pulled out into full extension and whilst traction is being thus applied the forearm should be flexed up. After reduction has been accomplished it is not necessary to fix the joint in full flexion at once. Fix the forearm with a collar and cuff in that degree of flexion which can be obtained without any interference of the circulation resulting. The swelling around the elbow-joint rapidly subsides and the degree of flexion may then be increased. Keep the arm in full flexion for a week, and then gradually lower to a right angle, permitting the patient active movements through the free range. When the arm has been lowered to a right angle the collar and cuff may be removed and the patient allowed the arm free.

Under no circumstances should deep massage or passive movements be given in injuries of the elbow-joint. They cause pain and excite muscle spasm, hence diminishing the range of movement which is already present, and in the particular injury we are considering they produce myositis ossificans. Full range of movement is obtained with active use, though it may take several months before full extension returns. Never try to hasten the return of movement in an elbow-joint by manipulation; it will always result in loss of movement instead of an improvement. In a certain number of injuries of this nature the reduction of the displaced epiphysis is difficult. Always hesitate before advising an open operation to replace it, for, in my experience, an open reduction results in a great amount of permanent stiffness. And what may not look perfectly satisfactory as a skiagram may yet result in excellent function.

The nightmare in the treatment of this injury is the onset of a Volkmann's ischæmic paralysis. It may be caused by interference with the circulation from too rigid flexion; therefore, diminish this if there is any doubt. It may result from a large extravasation of blood at the site of fracture, and if there is any question this must be evacuated. In some few instances it undoubtedly follows injury to the muscles at the time of the accident and is then inevitable.

Fracture of the internal epicondyle is caused by an abduction strain falling on the elbow-joint. The epicondyle is torn off and displaced downwards or, if the elbow-joint is opened up very much may become locked between the ulna and humerus. The treatment of this injury is an open reduction with fixation of the piece of bone torn off in its proper position either with catgut sutures through the aponeurosis, or by means of a bone peg. The elbow is then fixed in plaster for a fortnight at a right angle. Subsequently, when the plaster is removed, the patient is allowed and encouraged to use the arm, and no massage of any kind is allowed. If the epicondyle is not fixed back in position, it remains pulled down by the muscles arising from it, and the function of the elbow-joint suffers accordingly. As a late result the ulnar nerve may be stretched and paresis may follow. The displacement of the epicondyle is always much greater than the radiogram would suggest.

Fractures of the head of the radius give rise to a great interference with function. Minor cracks are best treated with the elbow fixed in plaster for a fortnight; then there should be active use and no other treatment. When the anterior portion of the head is broken off, its removal at an early date is indicated, the remainder of the head being left untouched. If the head is comminuted all the loose fragments must be removed, and in both instances the patient is most comfortable with plaster fixation for 14 days. Complete excision of the head of the radius is to be avoided if possible, for it is sometimes followed by the subluxation of the distal end of the ulna and a weak wrist.

Fracture of the olecranon.—If there is little separation, fixation in plaster at a right angle is all that is necessary; thereafter the patient is allowed active use. When there is marked displacement of the upper fragment they must be wired together, and fixation in plaster subsequently adds to the patient's comfort. Fixation at 90° flexion is the position of choice. The fragments lie in position well and the patient is comfortable. Active use is allowed after the plaster is removed. The old position of full extension for the treatment of this injury should be given up, since it is uncomfortable and often confines the patient to bed.

Fractures of the lower end of the humerus in the adult are either T-shaped or comminuted. The conservative treatment of these injuries, in my opinion, gives the most satisfactory functional result, even if it is not possible to restore the fragments to their proper position. Open operation with fixation of the fragments by means of plates or screws may result in perfect anatomical reposition, but it also produces a very stiff joint with little if any movement. Under an anæsthetic the displacement of the fragments should be reduced as much as possible, and the arm should be fixed at a right angle in a sling with a posterior plaster splint. After the pain has started to subside, the patient can be allowed to have radiant heat and encouraged to move the joint so long as muscle spasm is not excited.

It will be observed that I have constantly laid stress on the value of active movements as an aid to the restoration of function after injury to the elbow-joint. Also that I have expressed a dislike for massage and passive movements. The elbow-joint after an accident responds to rough handling by becoming stiff, and once it has done so full range of movement is seldom restored.

DIVERTICULITIS

(MR. ROCK CARLING)

DIVERTICULA are pouches of mucous membrane which protrude through the muscular coat of the colon, especially in the sigmoid region. They occur between the mesenteric attachment and the lateral longitudinal bands, sometimes into the appendices epiploicæ, and sometimes through the points of entrance or emergence of vessels, and perhaps occasionally at unparticularised spots. They carry with them little or none of the muscular tissue; they tend to expand when the muscular coat has been passed, thus becoming flask-shaped; and they rarely attain a greater size than that of a black-currant or a very small cherry. Bowel contents (including the material of an opaque enema) enter them freely and escape with little delay; sometimes so easily that they may fail to reveal themselves on a film. There may be but one or two—there may be dozens; and though by far most common in the sigmoid region, they may be found distributed throughout the colon and even in the cæcum.

Many single diverticula are certainly congenital, and the multiple form has been observed in embryos. The mere existence of diverticula does not necessarily involve any ill-health, any more than does the existence of a vermiform appendix. The pathology of diverticulitis is very like that of appendicitis. So long as the normal contents are free to escape there is no trouble, but if the contents be abnormal or too long retained, or the virulence of the bacteria be enhanced, organisms invade the tissues. The result may be mere catarrhal swelling of the mucosa, with further obstruction; or an abscess may form and burst inwards, leaving an ulcer; or burst outwards, leading to peritonitis. Even if no gross abscess is formed, adhesive inflammation may lead to attachment of the sigmoid to the bladder, or to other parts of the intestinal tract, or to the uterus and adnexa. Again, it may produce widespread cellular infiltration of the bowel wall, the formation of granulation tissue and, in due course, the proliferation of fibrous tissue and fat, with formation of a considerable tumour; finally resulting in a fibrous stricture, narrow and string-like or extensive and tubular. In many cases there are copious deposits of fat in the appendices, the subperitoneal space, and the mesentery. The inflamed diverticulum, when eroded, may lead to long fistulous tracks, winding towards the serous surface. Apart from narrowing, the general mucosa of the affected part of the bowel is not often abnormal; ulceration, local mucous or membranous catarrh are alike exceptional.

Some of the symptoms—such as abdominal discomfort, flatulence, and change of habit as to stools—attract little attention because they are common in both sexes as age advances, and are usually present round about the sixtieth year. Pain may be constant, or frequently recurrent, the intervals varying from a few days to many months. It usually occurs in the left flank, left side of the abdomen, or more widely on the left side from below the axilla to well down the thigh. Exceptionally, the pain may be right-sided, or suprapubic or vaguely "pelvic." It may accompany or follow evacuation of the bowels, perhaps with tenesmus. Cystitis may be the outstanding feature. Fever is slight, except in cases of abscess. Neither loss of weight nor loss of appetite is conspicuous. The secondary anæmia has no special features. When perforation peritonitis or intestinal obstruction occur it is without precise indication of diverticular origin.

Tenderness in the left iliac fossa is the predominant clinical sign, and it is often possible to feel the lowest part of the descending and sigmoid colon as a tender, tense, tubular mass, having the appropriate lie and course. The stools may be normal, or of late smaller than usual; neither blood nor mucus is constantly present and never in great amount; neither diarrhœa nor constipation is a regular feature, and rarely is either conspicuous. The passage of gas per urethram suggests a fistula of diverticular rather than of neoplastic origin.

Upon suspicion radiograms after opaque enema should be taken, not only antero-posteriorly but also with more than one axis of obliquity; not only with the bowel filling and filled, but also emptying and emptied, this last especially, since it may be only when the main barium mass has passed that the still-full diverticula throw clearly defined shadows.

The mildest cases should be treated by paraffin, lavage, and atropine. Graver cases call for colostomy, which should be kept open for three, six, or more months. Radiograms indicate progress and suggest the time for closure. It is probable that any considerable mass will result in narrowing, and some masses cannot be distinguished from cancer. When in doubt, resection is indicated. If this be impossible, an exclusion operation is sometimes practicable.

When intestinal obstruction is due to a band or loop adherent to the sigmoid, it should be remembered that the point of attachment may be concealing the orifice of a diverticular sinus. Vesical fistula can be successfully dealt with after a colostomy. Some diverticula, especially in the cæcal region, can be invaginated or excised.

Differential diagnosis is difficult. In colitis, the amount of mucus passed is much greater; diarrhœa is more severe and constipation more capricious—blood and membrane are likely to be passed freely. The extent of the tenderness is distributed much more uniformly round the colon, and the temperature is not infrequently subnormal. In cases of stricture there is a history of dysentery—or of perimetritis or of proctitis—or it may be evidence of past syphilis. Fæcal accumulation is more likely and more obvious. In adenoma with chronic partial intussusception there is sharp hæmorrhage, and the sigmoidoscope may give positive evidence. The real difficulty arises with cancer of the colon. The duration of symptoms is in general shorter; blood and mucus of some amount are more constant; diarrhœa may be troublesome, and the stools fœtid; distension of the abdomen is slowly and steadily, though insidiously, progressive; while loss of weight may be obvious and loss of appetite pronounced. There is, I think, much less tenderness, less pain, and less spasm. Absence of fever is just worth noting.

An error will be less likely if the alternative diagnosis of diverticulitis be remembered, and investigation be rigorously pursued until the point is settled.

MARY STEVENS MATERNITY HOME, OLDSWINFORD. Sir Hilton Young, the Minister of Health, last week opened the Mary Stevens Maternity Home at Oldswinford, Stourbridge, which has been given by Mr. Ernest Stevens, of Prescot House, Stourbridge, in memory of his wife. The building is the property of the Stourbridge town council which has leased it to the Worcestershire county council which has set up a committee to administer it. The cost of maintenance for the first year will be defrayed by Mr. Stevens. There are 15 beds, and the building stands in the park-like surroundings of White Hall, on the site of which it has been built.

SPECIAL ARTICLES

NOMENCLATURE OF MENTAL DISEASE

A PROJECT FOR ITS INTERNATIONAL UNIFICATION

BY DORIS M. ODLUM, M.R.C.S. ENG., D.P.M.

JOINT HONORARY SECRETARY TO THE NATIONAL COUNCIL FOR MENTAL HYGIENE

AT a scientific session of the European Committee for Mental Hygiene held in Paris on May 31st last, Dr. Henri Bersot (Landeron, Neuchâtel) presented a report dealing with the unification of international statistics in relation to mental diseases. At the World Congress on Mental Hygiene held in Washington in 1930 a standing committee on statistics was set up, the need for a common basis of nomenclature in mental diseases being recognised as fundamental. A glance at p. 13 of the sixth edition (1931) of "The Nomenclature of Diseases," drawn up by a joint committee appointed by the Royal College of Physicians of London, will be sufficient to show the unsatisfactory state of our present terminology, especially in regard to borderland conditions, which are classified under the generic term of psychoneuroses.

Dr. Bersot in his paper states definitely that he does not wish his draft scheme to be accepted absolutely, but merely to provide a broad general basis on which a common meeting ground may be established. In very few countries is there any attempt at a really scientific classification. The official statistics are mostly based on a classification which is drawn up rather with an eye to administrative than scientific considerations. It might be unreasonable to expect any radical change in official classification which would involve expense and loss of continuity, but sufficient modification could be made to enable each country to come into line with a common schema for the purpose of international statistics.

The classification tentatively put forward by Dr. Bersot relates only to established psychoses and defective mental development and is as follows :—

(A) Congenital troubles.
- (1) Oligophrenia.
  - (*a*) Idiocy.
  - (*b*) Imbecility.
  - (*c*) Feeble-mindedness (*débilité*).
  - (*d*) Cretinism.

(B) Endogenous psychoses.
- (1) Affective psychoses.
  - (*a*) Mania.
  - (*b*) Melancholia.
  - (*c*) Other forms.
- (2) Schizophrenia.
- (3) Other forms.

(C) Reactive psychoses (*psychoses réactionelles*) (probably better described as adventitious or exogenous).
- (1) Psychogenic type, hysteric (*par psychogénie, hystérie*).
- (2) Other forms.

(D) Symptomatic psychoses.
- (1) Resulting from uræmia, diabetes, &c.
- (2) " " nervous diseases, &c.
- (3) Other forms.

(E) Organic states—encephalopathies.
- (1) General paralysis.
- (2) Cerebral syphilis.
- (3) Pellagra.
- (4) Encephalitis, various forms.
- (5) Senile psychosis.
- (6) Post-apopletic psychosis.
- (7) Post-traumatic psychosis.
- (8) Cerebral tumours.
- (9) Other forms.

(F) Epilepsy.
- (1) Essential or idiopathic.
- (2) Other forms.

(G) Toxic psychoses.
- (1) Alcoholism, various forms.
- (2) Morphinism.
  - (*a*) Simple.
  - (*b*) With complications.
- (3) Cocainism.
- (4) Other forms.

Dr. Bersot points out that the subtitles are not intended to be cut and dried, but merely to serve as illustrations. The essential is to agree upon the categories. Obviously the classification is incomplete, but the principle is important and is not wholly incompatible with the classification of the R.C.P. Nomenclature, the main headings of which are :

(1) Mental deficiency (amentia).
(2) Psychoses accompanying organic diseases.
- (*a*) Endogenous.
- (*b*) Exogenous (i.e., those resulting from the ingestion of poisonous substances).
- (*c*) Psychoses with primary degenerative brain changes.
- (*d*) Infective exhaustion psychoses.

(3) Functional psychoses (which include the affective and reactive groups of Bersot).
(4) Epileptic psychoses.

Dr. Bersot's scheme does not make any attempt to deal with borderland or psychoneurotic types, and it is precisely in regard to these that the R.C.P. Nomenclature is least satisfactory. The so-called psychoneuroses, with all their subheadings of neurasthenia, psychasthenia, and the like, are badly named, since the predominant factor is neither one which concerns the psyche or intellectual faculties nor the neural system as such, but is essentially a disturbance of the effective life which has secondary effects on the neurochemical functions of the organism. As it is the affective element which is predominantly concerned, the generic term "dysthymia" would appear to be acceptable. Those psychoses which the Bersot scheme called *psychoses affectives* would then come under the group "psychothymia" which is practically synonymous, and the cyclothymic syndrome (manic depressive)—which in some people is so extreme as to constitute a psychosis and in others so mild as to be no more than an instability of emotional equilibrium—would naturally find itself placed under the psychothymias or dysthymias, according to its severity. The R.C.P. Nomenclature has also a heading "Psychopathic personality," which in the present state of our knowledge is probably the best term available, although it is not quite in line with the continental word "psychopaths" which has a much wider connotation.

International statistics will probably be among the subjects to be discussed at the next reunion of the European Committee for Mental Hygiene, to be held in Rome in September, 1933, when it is hoped that individual psychiatrists and government officials will meet to discuss nomenclature and classification on a common international ground.

WHAT IS WRONG WITH THE MEDICAL CURRICULUM IN FRANCE?

(FROM OUR PARIS CORRESPONDENT)

IT would be easy and fairly accurate to answer this question with : Same as in Great Britain. There are however certain divergencies, of historically remote origin, in both the theoretical and practical education of the medical student in the two countries. One such divergency may be mentioned at once. In France there is an old tradition which sends the medical student straight to hospital in his first year. Discontent with many aspects of the French medical curricula led, some time ago, to their scrutiny by various bodies, from the *Conseil supérieur de l'instruction publique* downwards. Faculties and schools of

medicine have appointed their commissions of inquiry which have found a counterpart in the professional medical associations. The reports of these official and semi-official bodies, and the essays on the same subject by individual leaders of the medical profession, such as Prof. G. Roussy, have yielded an imposing mass of evidence. The conscientious investigator, who took the trouble to wade through it all, would probably emerge from the ordeal with the reassuring conclusion that, in regard to certain cardinal points, most of the would-be reformers are remarkably unanimous, at any rate in principle. In some quarters there seems to have been a tendency to grow impatient with the state of chaos into which medical education has slid, and to find a remedy in a clean sweep and completely new start. But it is pretty safe to prophesy that reforms will come by evolution rather than by revolution, and that the old edifice will be respected as far as its main architectural features are concerned.

Some reforms are already materialising. In January of this year the *Conseil supérieur*, after consulting the faculties and schools of medicine and the *Comité consultatif de l'enseignement supérieur*, adopted the practice of anonymous, written examinations, with an eliminatory function—a somewhat sinister expression—at the end of the first two years of study. This practice will come into effect at the beginning of the scholastic year 1933. It should comb out the undesirables early in their misguided careers if the faculties and schools of medicine are prepared to use this new weapon with severe impartiality. To promote such impartiality some would-be reformers have advocated another step—the appointment of travelling boards of examiners whose ignorance of personalities would be an automatic check on favouritism. Another suggestion, prompted by the same line of reasoning, is that students should be examined by other faculties than those to which they officially belong, so as not to benefit from nepotic adjustments. The objection raised to both these proposed remedies is that they would be too expensive.

Unanimity, in principle, has to all intents and purposes been achieved with regard to the adoption of a uniform system of medical education, and the addition of an obligatory sixth year to the curriculum. This sixth year is going to be a big bone of contention, and the subject of a new study by the faculties and schools of medicine. Many would like to see it allotted mainly, or even exclusively, to essentially practical work. It should be of special value to those students who are not successful in securing house appointments, and who in the past have not been able to enjoy enough clinical experience by partial or whole-time residence in hospital. Realisation of this in itself laudable principle must, however, largely depend on hospital accommodation. The beginning of the sixth year is, in the opinion of some authorities, a suitable point from which the future specialists and general practitioners should diverge, the one from the other. The future specialist would in this case spend both a sixth and a seventh year in the subject of his choice, whereas the future general practitioner would spend his sixth year in practical work as a hospital resident. Another function for the sixth year would be to serve as a reservoir for obligatory medical and surgical studies flowing over from the congested fourth and fifth years.

The teaching of preliminary studies such as physics and chemistry has inevitably come in for criticism. The modifications recommended in this field are in favour of such studies being given a more medical slant than heretofore. There is, in fact, a general demand for less theory and more practice; but at the same time, as indicated at the opening of this paper, there is a feeling, amounting to a conviction in some quarters, that it is a fundamentally unsound principle to let the student in his first year plunge into a world of morbid changes before he has familiarised himself with the normal by a systematic study of anatomy and physiology. These subjects can be treated on practical or theoretical lines; and many hope that the teachers will abate their scientific austerity in a way that will enable the future general practitioner to apply in his daily routine the lessons he has learnt from his study of physiology and anatomy.

Concrete reforms have been advocated in the *Presse médicale* by Dr. Leriche, who would have the student devote two years to the normal body, two to the morbid body, and the last two to hospital work. During the first two years he would learn in hospital how to examine the pulse and take the blood pressure, the percussion and auscultation of the normal heart and lungs, and the various other methods of exploring the body in health. He would thus master the radioscopic appearance of the bones and viscera in health, and learn from rectoscopy and the various other 'scopies what the rectum, larynx, nose, &c., look like in a normal person. During the two middle years of his curriculum he would study microbiology, parasitology, and the natural history of various morbid states. In his last two years he would walk the hospitals day and night, and study such subjects as pharmacology, therapeutics, obstetrics, hygiene, and preventive medicine. As for specialising, a minimum of two years should be required and, in the case of surgery, four years. The same writer would like to see the old diploma of *Maître juré en chirurgie* resuscitated. The formal recognition of such a diploma should be a check on the non-specialised doctor who, fancying he has a flair for operative surgery, undertakes it with a light-hearted and vicarious courage which some of his patients may learn to regret.

MEDICINE AND THE LAW

Medical Certificates and Non-attendance at School

AT a meeting of a regional education committee in Northern Ireland during September, surprise was expressed at the discovery that parents are not obliged to furnish school attendance committees with a doctor's certificate when children are unable to attend school. The Ministry of Education for Northern Ireland had written a letter to the local authority in Antrim stating that it was advised that education committees had no power to require a dispensary doctor to issue a medical certificate free of charge. There certainly appears to be no statutory basis for any such suggestion. The law in Northern Ireland (under Part VI. of the Education Act passed by the Belfast Parliament in 1923) resembles the English law to be found in Part IV. of our Act of 1921. The parent has a statutory duty to send the child to school unless there is "reasonable excuse"; it will be a good excuse if "the child has been prevented from attending school by sickness or any unavoidable cause." If the parent neglects his duty, the education authority can summon him to produce "information and explanation." Nothing is said as to the form this information or explanation should take, or as to

the evidence in support thereof. If what the parent says is unsatisfactory, a school attendance order can be made and a court of summary jurisdiction can enforce the order. In Northern Ireland, as in England and Scotland, there is a wide statutory power for the department to frame "grant regulations" governing the payment of local authorities' expenses in connexion with education. There is also, as in England, a statutory duty imposed upon the education authority to arrange for looking after the health and physical condition of school-children and to provide for medical inspection. None of these enactments, however, quite covers the case of paying for medical certificates where illness causes inability to attend school, or of exacting such certificates, without payment, from a dispensary doctor.

INTERNATIONAL UNION AGAINST TUBERCULOSIS

(FROM A CORRESPONDENT)

THE International Union against Tuberculosis, now in its fifteenth year, held its eighth international conference in Holland from Sept. 6th–9th. It is usual to select three topics for debate, concerned with biological, clinical, and sociological aspects of the disease. This year were chosen questions which are probably as controversial as any which authorities on tuberculosis have to consider—namely, (1) The Relations between Allergy and Immunity; (2) Treatment with Gold Solutions; and (3) Post-sanatorial Care of the Tuberculous.

Speaking on the first subject Prof. JULES BORDET (Brussels) distinguished between congenital and acquired immunity. Allergy, he said, was also an acquired property and probably favoured bactericidal action of the blood, but alone it was not sufficient.—Prof. LYLE CUMMINS (Cardiff) defined the problem more closely in a paper dealing with the relation between hypersensibility to the products of the tubercle bacillus and the augmented defensive powers against disease which result from infection. The increased "anti-resorptive" or anti-disseminative power possessed by allergic animals was clearly proved, he said, but according to A. R. Rich it was not due to allergy but to some other factor. Prof. Cummins, in South Africa, had not found that highly allergic individuals were resistant to tuberculosis. The facts were, indeed, the other way, the more marked the allergy the greater the activity of the disease. He believed that all the known manifestations of allergy—local, general, and focal—as produced by tuberculin tests, were harmful. Modern therapy tried to avoid allergic phenomena in the patient in order to shield the immunity factors. They were antagonistic to one another, although called into being by the same stimulus.—Prof. A. CALMETTE (Paris) said that allergy merely revealed the state of infection. It could not be considered part of immunity, for organisms which were refractory to tuberculous infection never became allergic if one injected into them the bacilli which were virulent to sensitive subjects. These factors which had an inhibiting effect on allergy had no influence on immunity. The principle of treatment by tuberculin was to make allergic phenomena disappear, but this did not lessen the resistance to reinfection.—Another aspect of the subject was considered by Dr. WILLIAM C. WHITE (Washington) who distinguished between the various chemical fractions which composed tuberculin.

In opening a discussion on the Use of Gold Therapy Prof. LUIS SAYÉ (Barcelona) said it was agreed that the best time for the use of gold salts was the early stages of the disease before ulceration and fibrous tissue have become prominent. But he did not therefore discountenance their use in advanced cases, for definite improvement could be shown in radiograms and the favourable results were increasing year by year. In the early stages, the successful results were over 80 per cent., and even with advanced cases, 25 per cent. of patients were benefited. The treatment might have an important contributory effect upon the success of pneumothorax. Ambulatory patients and children were good subjects, and in his experience, absolute intolerance was not found in more than 3 to 10 per cent. of cases.—The same optimistic view as regards intolerance was taken by Dr. L. S. T. BURRELL (London) who grouped the unfavourable reactions under the heading of fever, usually subsiding if the treatment is discontinued; albuminuria, of which he had never seen a severe case with moderate dosage; and skin reactions, probably the result of the accumulation of the gold in the body. In his experience of the remedy, the amount of sputum diminished under treatment, tubercle bacilli lessened or disappeared, and fibrous tissue increased. He had had best results from Sanocrysin and Crisalbine.—Dr. BURNS AMBERSON (New York) had reached an opposite conclusion. In comparing two groups of cases (admittedly small in number) he had not found beneficial effects, although the patients had been controlled carefully. Any remedy, Dr. Amberson pointed out, might be successful in early cases.—Prof. G. SCHRÖDER (Schömberg) thought it certain that the action of sanocrysin did not depend on actual killing of the bacilli. He believed that the drug stimulated the reticulo-endothelial system. Solganol oil was a useful adjuvant to gold treatment.

On the third question, the After-care of the Tuberculous, the opener, Dr. B. H. Vos (Hellendoorn Sanatorium, Holland) spoke purely as a clinician, and throughout his paper emphasised the importance of clinical control and supervision for each case. In Dutch sanatoriums, patients are kept until they are able to work for eight hours per day. Sheltered employment was the rule. Dr. Vos spoke of industrial settlements and considered that the financial aspect of the duration of the patient's stay in the colony was still unsettled. The need for after-care could be reduced by improvement in clinical treatment and by more intensive development of occupational therapy.—Dr. H. A. PATTISON described the work at Potts Memorial Hospital, New York. Many of the cases needing after-treatment acquired tuberculosis before they acquired the knowledge of any trade. They needed strictly vocational training. He described a variety of occupations for which his institution tried to cater. At Tomahawk Lake Camp, the average period of residence was ten months.—Dr. HARLEY WILLIAMS (London) described the arrangements for care work in Britain, chiefly by means of care committees, which were being organised in all parts of the country, partly voluntary and partly as an official subsidy. He deprecated the use of the term "after-care" on the ground that the patient has to be considered a member of a family unit.—Dr. JANE WALKER (London) would like to see simple houses of residence, established for those cases which are likely to last for some years with no great chance of improvement. Simple

conditions and supervision in such cases might be all that was necessary. Education was a vital necessity in the treatment of tuberculosis. It was essential to fill the minds of patients with positive interests.—Dr. STEPHEN J. MAHER (New Haven, Connecticut) said it was a mistake to suppose that the ordinary arrested or cured case of pulmonary tuberculosis needs to be coddled and trained for long periods in some intermediate institution before being allowed to resume his old ideas about the importance of time, money, and achievement. Failure to secure employment was largely due to wrong ideas about the contagiousness of tubercle among adults. The profession must now fight these ideas, and at the present time of economy it must concentrate on curing patients in the sanatorium instead of asking for "post-graduate" schools, factories, or villages.

The social events of the conference were memorable. Excursions were arranged throughout Holland, to places of medical interest and elsewhere, with the unobtrusive efficiency characteristic of the country.

THE OXFORD UNIVERSITY PROVIDENT ASSOCIATION

AN association has been formed in order to meet the special medical needs and risks of Oxford undergraduates. It is designed to give the student (1) early medical advice and adequate nursing accommodation in the event of illness or accident, and (2) a substantial contribution towards the expenses of operation and nursing when these are unavoidable. The contract is a personal one, renewable from year to year at the discretion of the member and of the Association, and, once the initial waiting period of three months has elapsed, the benefits apply to sickness or accident anywhere and at any time in the year. The annual premium is £3, and the benefits obtainable are as follows:—

(*a*) *Nursing.*—A contribution not exceeding £6 per week for a period up to four weeks towards the cost of maintenance in a nursing home or in a private paying bed of a hospital (maximum £24 in any year).

(*b*) *Investigations and consultations.*—A contribution towards the fee of a consultant of £2 2*s.* or £3 3*s.*, according to whether the patient visits or is visited by the consultant (maximum £8 8*s.* in any year), and a grant not exceeding £3 3*s.* for X ray examination and not exceeding £2 2*s.* for pathological examinations.

(*c*) *Surgical operations.*—Contributions not exceeding £21 in any year towards surgeon's fees.

(*d*) *Anæsthetics.*—Contributions not exceeding £2 2*s.* in any year.

(*e*) *Electrical and massage treatment.*—A grant at rates not exceeding 10*s.* 6*d.* per treatment (maximum £3 3*s.* in any year).

(*f*) *General medical services.*—Contributions of two-thirds of the fees of general practitioners (maximum £8 in any year).

The liability of the Association is limited (*a*) to the payment of £63 to a member in any one year, and (*b*) to the payment of £63 to a member in respect of any one operation or illness. The arrangements for professional services and treatment are entirely in the hands of the member, in consultation with his doctor.

The Association is for mutual benefit only. The council includes among its members the Master of Balliol, the Warden of Wadham, the President of Magdalen College, Oxford, and the Principal of the Society of Oxford Home Students, with Sir Farquhar Buzzard as chairman. Although the Association was only registered during the vacation, and term has not yet started, nearly 700 applications for membership have already been received. Further particulars can be obtained from the registrar at 116, St. Aldate's, Oxford.

THE SERVICES

COMMISSIONS IN THE ROYAL ARMY MEDICAL CORPS

Twenty-five permanent commissions in the Royal Army Medical Corps are being offered to qualified medical practitioners, under 28 years of age. There will be no entrance examination, but candidates will be required to present themselves in London for interview and physical examination on Oct. 21st. Applications should reach the War Office not later than Oct. 14th. Further information may be obtained, either by letter or in person, from the Assistant Director-General, Army Medical Services, the War Office, Whitehall, London, S.W. 1.

ROYAL NAVAL MEDICAL SERVICE

Surg. Lt. M. J. Brosnan is transferred to the Permanent List.

The following appointments are notified: Surg. Lt.-Comdrs. M. Barton to *Pembroke*, for Chatham Dockyard; T. G. B. Crawford to *Pembroke*, for Chatham Hospital; and T. L. J. Barry to *President*, for course. Surg. Lt. T. W. Froggatt to *Vivid*, for R.M. Infirmary, Plymouth.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdr. A. G. V. Elder is placed on the retd. list.
Proby. Surg. Lt. A. P. Gorham to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. T. B. Moriarty, having attained the age for compulsory retirement, is placed on ret. pay.
Maj. R. M. Dickson to be Lt.-Col.
Maj. W. H. Cornelius is placed on the half-pay list on account of ill-health.
The undermentioned from the secd. list are restd. to the estabt.: Majs. J. W. C. Stubbs and J. R. N. Warburton.
Lt. R. H. Small relinquishes his temp. commn.
Lt. J. M. Ryan to be Capt. (prov.).

ARMY DENTAL CORPS

Lt. E. C. Browne to be Capt.

INDIAN MEDICAL SERVICE

Lt. D. H. Waldron to be Capt.
Lts. (T.C.) C. H. Dhala and S. D. Dalal to be Capts. (T.C.).

ROYAL AIR FORCE

Flying Officer G. A. M. Knight is promoted to the rank of Flight Lt.

CONFERENCE ON CONTRIBUTORY SCHEMES.—The second annual conference of the British Hospitals Contributory Schemes Association was held at Torquay last week under the presidency of Major B. J. T. Ford, chairman of the Birmingham Association. Mr. T. W. Place, secretary of the Birmingham Association, read a paper on the Value of association in advancing Contributory Scheme Principles. He said that experience had shown that the rate of contribution required in order to finance a scheme to provide reasonable support for institutions giving treatment to its contributors was approximately 3*d.* per week per member. This was the maximum sum which the average worker could afford to pay, and the average contribution of most "flat rate" and "1*d.* in the £" schemes. A contributor transferring from one district to another should be considered eligible to participate in the privileges of the new scheme immediately. This gave the contributor a sense of security, and would do much to popularise the system. On the question of payments to municipal authorities Mr. Place read the recommendation of the executive committee that a contributory scheme should not make payment at higher rates than the authority would obtain by the normal process of direct assessment of patients or those liable to be charged on their behalf. He believed that an average of £1 per case was a reasonable sum to pay.

CORRESPONDENCE

WANTED A HOSPITAL EXCHANGE IN LONDON

To the Editor of THE LANCET

SIR,—May not some system of centralisation for the admission of urgent and acute cases to the several general hospitals be adopted, somewhat on the lines of the County Council's fever hospitals services? Many general practitioners have probably at some time or other experienced the greatest difficulty and delay in finding hospital accommodation for an urgent case; telephone inquiries, interminable waiting, more inquiries, and then more waiting, and in the end, perhaps, nothing—a negative result, no vacancy! I can recall occasions when I have spent over an hour endeavouring to find hospital accommodation for an acute abdominal case.

Such a state of things is harassing to doctor and patient alike, and I would suggest the establishment of a central body, or bureau, which would deal with all the available local hospital accommodation, and allocate cases for admission when the need arose. Although there are undoubted difficulties in connexion with the administration of such a scheme—which differs in some respects from the example quoted above—yet I feel sure that these are not unsurmountable, and that the value of such a service can hardly be gainsaid.

I am, Sir, yours faithfully,

LOUIS M. LEVENTON, L.R.C.P. & S.

Liverpool-road, N., Sept. 23rd, 1932.

THE INCREASE IN ARSENIC-RESISTANT SYPHILIS

To the Editor of THE LANCET

SIR,—The issue raised by Dr. Sequeira is well timed and deserving of careful consideration by all interested in the modern treatment of syphilis. His purpose will not be well served by Colonel Burke's assertion that dermatologists fail to recognise that syphilis is not a cutaneous disease, but a general infection of the cardiovascular system. I hope to offer some evidence that there are grounds for the thesis put forward by Drake and Thomson in the paper referred to by Dr. Sequeira, and that, whatever the cause, inefficient or inadequate treatment is not the main or even a frequent factor. With the question what should constitute adequate treatment I do not propose to deal at present, although I submit that in five out of my six cases here cited the treatment was entirely adequate in the accepted sense of the term, and yet failed to prevent the onset of symptoms which can only be characterised as arsenic-resistant.

Before quoting my own cases I would refer briefly to the remarkable case instanced by Kloeppel.[1]

This was a man who contracted an atypical chancre three and a half weeks after coitus, and infected his wife three weeks later. There were copious spirochætes in the discharges of both primary lesions, and the Wassermann test was negative in both patients. The man was given no less than 2·3 g. of neosalvarsan in divided doses in eight days—the woman 1·05 g. in 7 days (a total that should appease the most strenuous of venereo-therapists)—without the slightest effect on the clinical appearances or on the apparent viability of the organisms. The lesions cleared up promptly on substituting a mercurial intravenous injection for the arsenical, and the author argues with seeming justification that the strain of the infecting organism must therefore have been arsenic-resistant.

[1] Kloeppel, F. W.: Münch. med. Woch., 1926, lxxiii., 1936.

It is not often that the partners in a luetic infection are simultaneously under treatment by the same physician, and as cases of resistant syphilis are relatively rare, I count myself fortunate in being able to report a dual infection of a resistant character.

CASE 1.—Miss A., aged 29, consulted me on April 13th, 1932, for a crusted and slightly irritable eruption on the scalp, both palms, and right anguli oris. These symptoms had been present since January, when there were also some vulvar sores, following a risk taken in October, 1931. The W.R. was positive, and this in spite of a course of eight injections of sulpharsenol (3·3 g.), which had concluded in the last week of March. There were no buccal or pharyngeal lesions, and no adenitis. In view of the failure of N.A.B. to prevent this clinical and serological relapse, and of the supposed more potent action of the silver salt, 0·15 g. was injected on April 13th. Slight improvement of the mouth lesion followed, but the crusting of the scalp and the palmar patches were not influenced perceptibly. On the 20th 0·2 g. neo-silver salvarsan was given, and was accompanied by flushing and nitritoid symptoms, not pronounced enough to require adrenaline. On the 28th the mouth lesion had cleared up, but the scalp and palms showed little change. On May 5th, in view of the previous nitritoid tendency, 0·45 N.A.B. was given in 10 c.cm. Afenile (10 per cent. calcium chloride and urea solution), but in spite of this precaution the patient felt unwell, and had abdominal pain and diarrhœa on the following day. Two further injections of 0·15 N.S.S. were given on May 13th and 20th, but both the scalp and palmar lesions were still present although improving on the 27th, when she was last seen and referred to her home practitioner for bismuth injections for a period of six weeks.

Palmar lesions seem to be particularly common in this resistant type of syphilis. They occurred, as will be seen, in the case of this patient's partner, and in two of our hospital cases, and is stated by Nicholas, Lebeuf, and Charpy,[2] to be a relatively common manifestation.

CASE 2.—Mr. B., aged 42, who admitted responsibility for the infection of the preceding case, contracted the disease in August, 1931. A chancre appeared and was first observed on Oct. 22nd. The W.R. was already positive, and 12 injections of N.A.B. (7·0 g. in all) and ten of a bismuth preparation were given in weekly doses for the remainder of October and in November and December. In the first week of January an eruption appeared on the trunk and extremities. Three more intravenous injections of N.A.B. had no effect, in fact they appeared to aggravate it. Six weekly injections of silver salvarsan and iodide by the mouth were advised, and when I saw him on July 21st, 1932, I made the following note: "It is a deeply infiltrated scaly, nummular, psoriasiform eruption. There is a marked tendency to pigmentation, not only of the residual cicatrices, but of otherwise normal skin, especially on the neck and shoulders. Of the active lesions, varying in size from a threepenny bit to half-a-crown, some are covered with crust, others scaly. On the scalp the condition is that of a moderate seborrhœa, and there are no ulcerative tendencies as in Miss A., although as in her case there are infiltrated circinate lesions on the palms. There is no adenitis, and the W.R. has been negative on three occasions since the eruption first appeared in January." In view of the compete failure of the arsenobenzole group to achieve a clearance of the eruption it was decided to try the effect of protein shock methods. Malaria having been refused, Aolan (detoxicated milk), 5 c.cm., were injected intramuscularly into each buttock on July 21st, 1932. A pronounced febrile reaction resulted on the following night, and on the 27th the eruption was decidedly less crusted and infiltrated and no fresh lesions had appeared. Two more 5 c.cm. injections of aolan and iodides by the mouth were advised, and three weeks later the eruption had been replaced by stains and soft cicatrices, and no fresh lesions were noted.

This favourable issue supports the advocacy of Beume [3] for the value of whole blood injections—an even milder protein shock effect—in cases of salvarsan-resistant syphilis. The patient has now been having two injections of bismogenol, 1 c.cm. each, per week, and except for his pigmentation is entirely free of symptoms. The general resemblance of the clinical

[2] Bull. de la soc. franc. de derm. and syph., 1932, xxxix., 16.
[3] Derm. Woch., 1926, p. 240; and 1929, lxxxviii., 812.

manifestations in these two cases was very striking. In both the lesions were remarkably persistent and intractable to all the usual forms of treatment, which had been vigorously pushed from the commencement. The type in both might be called psoriasiform, with the reservation that the colour and depth of infiltration made it quite evident that the latter disease could not be considered. The striking feature in the male patient was the tendency to pigmentation, both in the stains and cicatrices of the healed lesions and, apparently, quite apart from them around the posterior aspect of the neck. The tendency was not apparent in any of the other resistant cases in this series. The W.R., as stated, was positive in the case of the woman at the conclusion of her course, and at the time when the secondary eruption first appeared, while in the man it was negative throughout. From this instance, then, it might be argued that the blood reaction plays little or no part either in the production or prevention of the arsenic-resistant eruptions. The W.R. reports in such cases have frequently exhibited apparent contradictions. The usual divergence is a sero-negative clinical relapse, with a return to the positive phase when the eruption begins to involute. In the above cases it is interesting to note that the woman, whose manifestations yielded more readily than the man's, had a positive test, while his was negative during the period of their greatest activity. (I have had no opportunity of determining the present state of the blood.)

CASE 3.—Mr. C., aged 36, a hospital patient, provides another example of the resistant syphilide. On Jan. 20th, 1932, spirochætes were demonstrated in his small superficial coronal sore, and by the first week in March 4·5 g. of N.A.B. and 7 c.cm. of bismogenol had been injected. On April 20th the W.R. was positive, and a second course of 4·8 g. of N.A.B. was given. During this period a psoriasiform eruption developed on the extremities, on the back, and round the nipples. There was superficial scarring in some of the lesions, but no adenitis. This eruption was still active on July 22nd and the W.R. was positive. On August 2nd jaundice developed, so that N.A.B. injections could no longer be administered.

CASE 4.—Mr. D., aged 33, developed a maculo-papular eruption while under treatment for a gonorrhœal periurethral abscess on Nov. 3rd, 1931. The W. R. was strongly positive. The usual weekly injections of N.A.B. (4·5 g. in all) and intramuscular bismuth completed the first course on Jan. 5th, 1932. On the 12th anal condylomata appeared, and on the same day 0·25 g. of silver salvarsan was administered and repeated weekly with iodides by the mouth until March 23rd. On Feb. 8th the voice became husky, and psoriasiform lesions were noted on the arms. On March 15th there was dysphagia, and the laryngologist reported a syphilitic glossitis, with swelling of the epiglottis and ary-epiglottic folds. The patient was ordered large doses of Zittmann's decoction (Decoct. Sarsæ Co.). The W.R. was strongly positive. As skin lesions were still active on March 30th a fresh course of silver salvarsan (1·15 g.) was given, but on April 26th it was noted that "typical condylomata on the scrotum and papular scalp lesions had made their appearance." On May 4th treatment with Bivatol (a soluble preparation of bisalicylate in oil) was begun and given intramuscularly twice weekly until June 17th, 16 c.cm. in all. Improvement followed the first two injections, and healing of all symptoms was complete on the latter date. On July 15th, three and a half months after the last arsenic injection, the patient developed jaundice, which fortunately proved to be transient, so that the bismuth injections were shortly resumed.

Case 4, which clearly belongs to the arsenic-resistant group, illustrates the contention put forward by Nicholas, Lebeuf, and Charpy,[2] that bismuth will often succeed where various members of the arseno-benzine series have failed to effect a clearance of the cutaneous lesions. Case 5 is the only one of my series that supports Colonel Burke's view that arsenic-resistant syphilis is the result of inefficient treatment at the outset.

CASE 5.—Mr. E., aged 24, presented himself with a primary chancre on August 5th, 1930, but neglected to attend after his second injection of N.A.B. A month later he reappeared with impetiginous lesions on the body, and unmistakable syphilitic palmar lesions of a psoriasiform type. His attendance continued to be irregular, but injections were given on Oct. 14th and 21st. On the 22nd I noted a generalised eruption of papular psoriasiform type. The W.R. was strongly positive, and a biopsy of one of the papules confirmed the syphilitic nature of the symptoms. This case also eventually yielded to intensive treatment with bismuth, the eruption having proved intractable after 3·9 g. of N.A.B. subsequently administered.

The criticism of inadequate treatment cannot apply to Case 6—the last of my series.

CASE 6. — Mr. F. presented himself on March 7th 1932, with a penile sore of a week's duration. Spirochætes were found in plenty, the W.R. was negative, and between March 7th and May 18th he received 5·15 g. N.A.B. and 11 c.cm. of bismogenol. A month later he began his second course, and had been given 2·25 g. when on August 3rd he developed diarrhœa and vomiting, so that no injection was given on the 10th. The following week an infiltrated crusted lesion appeared in the site of the original penile chancre, and 0·2 g. of silver salvarsan was injected. This had no effect on the lesion which was seen to be spreading the following week. As in the other cases, a satisfactory clearance was achieved with bismuth.

Whatever the mechanism of production of the arsenic-resistant case, and supposing for a moment that inadequate treatment is the cause, there still remains the problem that such cases appear to be increasing, as anticipated by McIntosh and Fildes in 1911.[4] Drake and Thomson illustrate the increase graphically, and while their schedule of treatment (even if it is inadequate according to modern standards) has not varied since 1927, there has been a progressive increase of clinical and serological relapses since that date to the present time. In my own cases, with the exception of Case 5, the treatment had been orthodox and the attendances regular, and yet these malignant resistant symptoms developed—in Case 4 *actually during a course of injections*, and ergo, in spite of it. It seems to me that a theory of inadequate attack entirely fails to explain a failure of this kind. It will be noted that the type of relapse in Drake and Thomson's series is the gumma. I have had no instances of this either in private or hospital practice. The cases detailed above are of the late secondary order, and seem to me to fall into a category which is not comparable either to the gummatous or the far more common serological resistance or relapse. I should be greatly interested to know if they are unique or whether any of your readers can amplify the abnormality of reaction from their own experience.

In conclusion, I should like to associate myself with the opinion expressed by Dr. Browdy, that it is not syphilis but syphilitics we are to treat. While it is necessary to have a working basis of treatment, we must treat individuals as necessity demands.

I am, Sir, yours faithfully,

HENRY C. SEMON, M.D., M.R.C.P.

London, W., Sept. 23rd, 1932.

DEATH CERTIFICATION

To the Editor of THE LANCET

SIR,—I read with great interest and agreement the letter of Dr. Jameson on the subject of death certification, which appeared in your issue of August 20th (p. 419). I also noted that in your observations on Dr. Jameson's communication you intimated that it is the definite policy of the General Register Office to rely upon the opinion of the certificate and not upon arbitrary rules.

With great respect, may I venture to doubt if the desirable practice mentioned by you is really

[4] Syphilis from the Modern Standpoint. London, 1911, p. 221.

adopted in the General Register Office. In my experience I have found that the application of the rule of selection is invariably followed, and any disease in a lower group is preferred to one in a higher, notwithstanding the opinion of the certifying practitioner. Recently a patient was admitted to a local hospital in a state of diabetic coma, almost moribund, and death occurred within a few hours. A post-mortem examination was made and evidence of pulmonary tuberculosis was found. The death was certified as follows: "(*a*) Diabetic coma, (*b*) Tuberculosis of lungs, (P.M.)." In a written communication the certifying medical officer informed me that, although tuberculosis had been found as a result of post-mortem examination, "the immediate cause of death was diabetic coma." A copy of this communication was, therefore, forwarded to the General Register Office, but notwithstanding this information I am officially informed that the cause of death is to be classified to tuberculosis. The recorded cause of death is, therefore, inaccurate, the written opinion of the certifying practitioner is ignored, and the strict rule of selection applied.

I am, Sir, yours faithfully,

G. SOWDEN.
Medical Officer of Health, St. Pancras.

Sept. 14th, 1932.

ANAPHYLAXIS FROM BEE STINGS

To the Editor of THE LANCET

SIR,—Dr. Goodman will find answers to most of his questions in a paper on Allergy in Relation to the Bee Sting, by R. L. Benson and H. Semenov.[1]

They consider the harmful effects of bees under three headings: (1) The venom of the sting, which may produce a general and non-specific effect of varying intensity depending upon the rapidity of absorption. The pharmacologically active principle of bee venom appears to be non-nitrogenous and has an action suggesting a saponin. This substance may act as a dermolysin releasing histamine actually present in the skin, but Benson and Semenov have conducted interesting experiments from which it seems probable that the venom itself may contain a histamine-like substance. This if introduced into a vein may produce shock. (2) Allergic reactions due to pollen carried by bees. Cutaneous allergic reactions can be produced experimentally by testing certain pollen-sensitive individuals with extracts from the bodies of bees, but clinically such a happening must be a very chance phenomenon. (3) Allergic reactions in the human from sensitisation to allergens inherent in the bee. These reactions are of increasing degree with successive bites and consequently common in bee-keepers. One of the earliest of these was that reported by A. T. Waterhouse.[2] Desensitisation in these hypersensitive individuals may be brought about by increasing doses of bee extract made from the posterior eighth of an inch of the bee's body. Dr. Goodman's case seems to fall into this category, but it is remarkable that the sting a week previously was without any ill-effects. Possibly this sting was only venom, and free from the intrinsic bee protein which seems responsible for this third group.

The poison gland system of the bee consists of a small alkaline and a larger coiled acid gland, the secretion of both of which is poured into the bulbous base of the poison canal and mixed to form the poison. From the canal it is expelled during the stinging act by a valve-like structure on each of the hollow darts forming part of the barbed shaft which is left behind in the victim's flesh with the sting.

In a recent publication[3] I have summarised the reported cases of allergic reaction to various insect stings, bites, and emanations.

I am, Sir, yours faithfully,

London, W., Sept. 25th, 1932. GEORGE BRAY, M.B.

[1] Jour. Allergy, 1929–30, i., 105.
[2] THE LANCET, 1914, i., 946.

TREATMENT OF PNEUMONIA BY ARTIFICIAL PNEUMOTHORAX

To the Editor of THE LANCET

SIR,—In your issue of Jan. 2nd (p. 13) Dr. J. J. Coghlan described 6 cases of pneumonia treated by artificial pneumothorax. I have up to now adopted this form of treatment in 11 cases at the General Hospital, Madras, 4 of them being cases of acute fibrinous pleurisy. In the first 3 cases I adopted Coghlan's method of giving morphia and atropine half an hour before the induction; in all the other cases morphia was not given, and I did not observe any difference. So as to cause the least possible disturbance the patient is allowed to lie flat on the back with the arm on the affected side raised over the shoulder. I choose an interspace in the anterior axillary line where the lung is not consolidated—a precaution which is unnecessary according to Coghlan. After sterilising the skin thoroughly, I infiltrate with novocain 1 per cent. the whole track for the pneumothorax needle, including the parietal pleura. In my experience the inflamed parietal pleura is not so hypersensitive as Dr. Coghlan thinks; in two cases where I wanted to avoid two successive pricks, I performed the induction without novocain, the patients making no demur. In every case 500 c.cm. of air was inserted at the first induction, the amount being varied at the refills. In the cases of simple pleurisy no refill was given, nor in cases where crisis occurred and temperature remained normal after the first operation. I will add brief notes of the 7 cases of pneumonia.

CASE 1.—Well-nourished male, aged 35, admitted Feb. 15th, 1932, for fever and cough of four days' duration. Evident respiratory distress; temp., 101·5° F.; pulse, 120; resp., 40. Left basal consolidation. A.P. (500 c.cm.) on the second day of admission. The effect was dramatic. He had profuse perspiration in ten minutes and temperature came down to normal in two hours. This was the only case in my series in which a crisis occurred as early as in Dr. Coghlan's cases. Patient made an uneventful recovery.

CASE 2.—Male, aged 23, admitted March 7th, 1932, for fever, cough, and pain over the right side of the chest of 36 hours' duration. General condition bad though fairly well nourished. For two days signs indefinite, on third day definite consolidation of the right base with extensive pleural involvement. A.P. 500 c.cm. Pain immediately relieved. Temp. fell from 104° to 101·5° F. in six hours, with improvement in general condition. Developed delirium tremens the next day. Refill on sixth day after admission. Temp. fell from 104° to 99·5° F. in five hours, but rose again in a few hours and patient died the next evening. This case illustrates that A.P. induces an artificial crisis which does not necessarily correspond to the expected natural crisis.

CASE 3.—Male, aged 19, admitted March 7th, 1932, for pain on left side of chest and cough duration two days. Left basal consolidation, with well-marked pleuritic rub. A.P. 36 hours after admission. Temp. fell from 103° to 100° F. in five hours but rose again to 102° after two hours, and dropped to 99° the next morning—i.e., 18 hours after induction. As the evening temp. rose to 100° refill (500 c.cm.) given two days later. Discharged well on March 15th, 1932.

CASE 4.—Male, aged 30, admitted March 10th, 1932, for fever and pain on the right side of the chest and cough duration seven days. Consolidation of right lower lobe. A.P. on the same day. Pain immediately relieved, no

[3] Recent Advances in Allergy, London, 1931.

actual crisis. Temp. fell from 104° to 102° F. in six hours. On the third day a refill brought down temp. in 12 hours to 99°. Discharged well on March 15th, 1932.

CASE 5.—Male, aged 38, admitted March 21st, 1932, for fever, cough, and pain on the left side of the chest, duration two days. Left basal consolidation with pleurisy. A.P. (500 c.cm.) on the first day. Temp. fell from 105° to 102° F. in eight hours, with no marked diminution of respiratory rate. Relief of pain immediate. Temp. oscillating 102°–103° F. for next two days. On third day a refill caused a drop in the temp. in three hours, rose again next morning to 102.° Another refill brought the temp. down to normal in 10 hours time. After oscillating for another day or two temp. remained normal from March 28th. Discharged on April 3rd, 1932. In this case definite crisis occurred only after the third refill. Patient became delirious the day after induction and remained so till the second refill.

CASE 6.—Male, aged 21, admitted March 24th, 1932, for fever and pain on left side of the chest of five days' duration. Commencing consolidation with fibrinous pleurisy on the left base. A.P. on night of admission. Pain immediately relieved. Temp. fell from 105° to 102° in eight hours. Since it did not fall below 102° for the next two days a refill was given on the third day. Crisis occurred after 24 hours. This patient also became delirious the day after A.P. Discharged well on April 3rd, 1932.

CASE 7.—Male, came with a history of nine days' fever and cough. Consolidation of whole of right lung. A.P. on second day after admission. Temp. fell from 103° F. to normal in 20 hours. There was no subsequent rise.

I agree with Dr. Coghlan that the induction of A.P. gives immediate relief from pain. As regards temperature, in all my cases except one, the drop occurred only after six hours, whereas in his the crisis occurred within three hours. Only in two cases did the temperature drop to normal after the first induction. In all other cases there was only a fall of two or three degrees. In two cases only did profuse perspiration occur after A.P. There is no doubt that A.P. does produce an artificial crisis, often temporary, sometimes permanent; in our cases, the crisis was more delayed and less dramatic than in the cases described by Dr. Coghlan. He claims that dyspnœa is relieved in half an hour. I was not so fortunate in my results, for though the respiratory distress was relieved owing to disappearance of pain, the rate of respiration came down only with the fall in temperature. Though my results were not so brilliant as Dr. Coghlan's I am of opinion that treatment with A.P. deserves a trial in pneumonia. In cases of acute pleurisy the results are really dramatic. In lobar pneumonia it is an important auxiliary to other forms of treatment. But, as Dr. Coghlan says, lobar pneumonia is emphatically not the disease on which to gain a knowledge of the technique.

My thanks are due to Colonel Skinner for allowing me to try this method of treatment on his cases. I am indebted to Dr. J. Mani for helping me in the operations.—I am, Sir, yours faithfully,

R. VISWANATHAN, M.D.,
Assistant Professor of Medicine and Assistant to First Physician, General Hospital,
London, Sept. 16th, 1932. Madras.

PATHOGENESIS OF CAVITIES IN THE LUNGS

To the Editor of THE LANCET

SIR,—I do not think Dr. Sowerbutts's paper carries us much farther with regard to the ætiology of the annular shadows. I agree with Dr. Andrew Morland when he says that it is far-fetched to imagine that air passes through the bronchial wall, giving rise to a single bleb or cyst. On the other hand, Dr. Morland's theory of the causation of vomicæ cannot possibly be accepted without careful research. It is partly based, if I do not misunderstand him, on the fact that Dr. Vere Pearson in an isolated case found a positive pressure in a large cavity. But any of us working at artificial pneumothorax therapy observe from time to time positive and negative pressures which cannot be explained from our knowledge of pulmonary physics. The "paradoxical reading" is an example. It is obvious that if you insert an artificial pneumothorax needle into a vomica you may, on the analogy of artificial pneumothorax, get either a negative, positive, or atmospheric reading.

During the last year my assistant, Dr. A. J. P. Alexander, has taken great trouble to get accurate information about every case with annular shadows admitted here, and he has reached the following conclusions, with which I entirely agree :—

(*a*) 5 per cent. of all patients admitted showed one or more rings.

(*b*) Tubercle bacilli were found in the sputum of all the patients who had these shadows.

(*c*) The rings altered in size in no definite direction or time.

(*d*) The study of these rings in a collapsed lung has been of no practical value.

(*e*) In most cases no definite physical signs were detected over them.

(*f*) All the cases showed extensive shadows.

The work, therefore, was leading us nowhere. The only point of any real value was that T.B. were present in every case. If a ring was evidence of tuberculosis this last observation might be useful.

When in Canada and America in 1930 I got the impression—erroneous perhaps—that they considered every ring as evidence of a cavity. Dr. Alexander, who has just returned from the German post-graduate course run by the Joint Tuberculosis Council, tells me he got this impression too. If this is correct, the ætiology of the rings is of great practical importance, because collapse therapy is likely to be adopted wherever they are found. As Dr. Sowerbutts says, the question can obviously only be settled in the post-mortem room, with a team consisting of the clinician, the radiologist, and the pathologist. To this team a physiologist might well be added. I am, Sir, yours faithfully,

J. D. MACFIE.
Winsley Sanatorium, near Bath, Sept. 24th, 1932.

LATERAL THORACIC JERK: A SIGN OF ANEURYSM

To the Editor of THE LANCET

SIR,—When I wrote my account of the above sign of aneurysm of the descending aorta I mentioned having seen it with Dr. R. M. Scott, of Cleveland, in 1926. I have recently received a letter from Prof. F. C. Arrillaga, of Buenos Aires, calling my attention to a paper describing the same sign in the *Semana Médica* of April 9th, 1931, p. 937. Further papers by Dr. Arrillaga, with Dr. J. C. Dabove, appeared in the same journal later in the year (1931, ii., 7, 1253, and 1739), and he gives among others the following list of references to other authors which may be of interest to some of your readers :—

del Sel, M., and Taquini, A. C.: *Prensa Méd. Argent.*, 1931, xviii., 255.

Martini, T., and Joselevich, M.: *Semana Méd.*, 1931, ii., 1259.

Padilla, Cossio, and del Castillo: Ibid., 1932, ii., 76.

del Sel, Costa Bertani, and Gerlovich: *Prensa Méd. Argent.*, July 10th, 1932, p. 241.

Moia, B., and Dondo, H.: Soc. de Méd. Interna, August 26th, 1932.

I feel that without this letter the above references may elude readers in this country as they did me.

I am, Sir, yours faithfully,

GEOFFREY BOURNE.
Queen Anne-street, W., Sept. 26th, 1932.

PUBLIC HEALTH SERVICES

Public Assistance Institutions in the Counties

MOST of the county poor-law institutions transferred under the Local Government Act, 1930, are of the mixed workhouse type, and very few have separate hospitals which can be taken over by the health committees. Although large expenditure on new buildings is prohibited by financial stringency, some of the reports show that many improvements are possible under existing conditions.

In ESSEX (est. pop. 1,195,100) Dr. W. A. Bullough says that the public assistance institutions need a careful survey, with the object of reclassifying the patients and the accommodation available, but that such a survey is impossible with the present staff. In the meantime many inexpensive extensions and alterations have been made.

Thus a day room for 50 casuals has been provided for the Colchester institution, which will be eventually closed when extensions to the modernised Stanway institution have been completed. Electric lighting has been installed at Tendring, and improvements to the children's nursery have been carried out at Braintree. Saffron Walden institution will be closed when it is possible to erect a new building at Takeley. Improvements have been carried out to the laundry at Epping, and the erection of a new nurses' home at a cost of £11,000 has been approved. A new nurses' home has been nearly completed at Orsett. Many improvements have been effected at the Oldchurch-road Institution, Romford, so as to secure an efficient maternity block. A special puerperal fever unit has been established at this hospital, which actually functions as a general hospital for a population of about 350,000. A special puerperal fever unit has also been established at Chelmsford; whilst at Maldon there are 100 unused beds, the future of which is under consideration. A consulting staff has been appointed for the benefit of the 4 to 5 thousand inmates in these institutions, and will chiefly operate in connexion with Oldchurch Hospital.

Many administrative changes have been introduced. The amount of alcoholic liquor is to be reduced and its use standardised. Arrangements have been made for the improvement of the milk-supply. Steps have been taken to reduce the prevalence of bedsores. Waking hours have been under consideration. The average time for awakening the patients was 5 A.M., whilst the average time for the first meal was 7 A.M. The question of dietaries has received much attention and an attempt is being made to provide each inmate with a helping in accordance with appetite instead of the prescribed quantity laid down. Apparently the actual quantity of food mentioned in the orders of 1913 and 1930 has to be available, even if not actually served on the tables. The grading and salaries of the nursing staffs are under consideration, and it is intended at an early date to establish a county nursing service, whereby suitable candidates from the secondary and other schools can secure their three years' training in the county institutions.

In NORTHANTS (est. pop. 218,300) the report of Dr. J. M. Mackintosh shows that improvements have been made in the provision for the aged and infirm and the chronic sick. These have been secured by extensions at Kettering, whilst another extension at Oundle will enable the existing institution at Thrapston to be closed. The more difficult problem of providing modern accommodation for the sick and aged in the west of the county is to be met by extensions of the Daventry institution, which will enable the out-of-date mixed workhouses at Brackley, Brixworth, and Towcester to be closed, thus securing considerable economy in administration. As regards the acute sick, it is agreed that the voluntary hospitals are adequate to meet the case, and arrangements have been made for a suitable payment for the services rendered. Maternity work will be concentrated at the Kettering institution in coöperation with the Kettering general hospital. This will avoid the expense of maintaining midwives at other institutions. It is also suggested that new nursery accommodation should be provided at Kettering. During the present year it is hoped to make progress with the ascertainment and classification of mental cases, and proposals embodying principles approved by dietetic experts will be brought forward for all the institutions.

In DERBYSHIRE (est. pop. 618,500) the services of specialists have been made available for the public assistance institutions, and a preliminary meeting with the voluntary hospitals committee was held on Feb. 11th, 1932, to consider the hospital provision of the county.

In WILTSHIRE (est. pop. 294,100) the steps taken towards classification are the provision of the Marlborough Children's Hospital (40 beds), the concentration of difficult male cases requiring male nurses in special wards at Salisbury, the concentration of female mentally defectives at Wilton, and the use of the male wards at Purton for juvenile idiots and imbeciles. Apart from the care of the blind, no department of treatment has yet been removed from the poor-law.

In DURHAM (est. pop. 934,100) the problem of classification is receiving attention, and the public assistance committee has been able to help the Sedgefield mental hospital by the reception of 50 male and 50 female patients, suitable for transfer, on the "house" side of two institutions.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 17TH, 1932

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 19 (last week 9); scarlet fever, 1547; diphtheria, 854; enteric fever, 95; acute pneumonia (primary or influenzal), 446; puerperal fever, 41; puerperal pyrexia, 123; cerebro-spinal fever, 25; acute polio-myelitis, 38; acute polio-encephalitis, 4; encephalitis lethargica, 7; continued fever, 1 (Tyldesley, Lancs); dysentery, 21; ophthalmia neonatorum, 81. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 20th–21st was as follows:—Small-pox, 22 under treatment (last week 19 and 2 under observation); scarlet fever, 1214; diphtheria, 1351; enteric fever, 17; measles, 301; whooping-cough, 364; puerperal fever, 22 (plus 11 babies); encephalitis lethargica, 232; poliomyelitis, 5; "other diseases," 123. At St. Margaret's Hospital there were 18 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 7 (0) from measles, 7 (0) from scarlet fever, 21 (4) from whooping-cough, 39 (10) from diphtheria, 81 (17) from diarrhœa and enteritis under two years, and 13 (2) from influenza. The figures in parentheses are those for London itself.

Deaths from diarrhœa had not increased: Liverpool still stands highest with 13 deaths, Leeds following with 5, Birmingham with 4, Croydon, Manchester, and Leicester each 3. Barking recorded the only death from enteric fever. Three of the deaths from whooping-cough were reported from Southampton, 2 each from Sheffield, Leicester, and Grimsby.

The number of stillbirths notified during the week was 257 (corresponding to a rate of 40 per 1000 total births), including 38 in London.

PANEL AND CONTRACT PRACTICE

Appeals to the Ministry of Health

IF a complaint has been tried by a medical service subcommittee, and if either side is dissatisfied with the decision reached—and confirmed (or altered) by the main insurance committee—it may appeal to the Minister of Health. The whole matter is then investigated again, but on this occasion legal help may be obtained and all the evidence is given on oath before officials of the Ministry—usually with a barrister in the chair.

In London it has lately been the custom, perhaps from motives of economy, for the clerk to the committee or his deputy to represent the insurance committee at these appeal cases. Previously counsel were always briefed on these occasions, but experience seems to show that the clerk who has been present at the medical service subcommittee's hearing is quite capable of presenting the committee's case. At the same time it is somewhat questionable whether it is good policy that the clerk of the committee, who should really be an impartial administrator of the insurance regulations, should be the person to marshal the evidence so as to ensure if possible that the views of the practitioner do not prevail.

In the nature of things most appeals are by doctors against a decision in which the medical service subcommittee has found in favour of an insured person. In these cases counsel (or latterly the clerk) appears to urge the committee's decision on the appeal tribunal. There is room for doubt, however, whether the committee's influence is used with equal force in favour of a doctor who is defending an appeal by an insured person against the committee's decision. Furthermore, in charges against a practitioner the latter is apt to be handicapped by the fact that the incident in question may only be remembered with difficulty as one of 30 or 40 in his day's work, whereas to the patient it is probably the only important event of the day. Even then the patient very often reports it wrongly, as can be proved later by prescriptions and written testimony.

There are, at present, some important outstanding cases whose appeals have not yet been heard. One of them, already described at some length in our columns, is the case of an elderly practitioner who was refused permission to employ an assistant on the ground that he, as principal, did not do enough personal work in the practice. The practice was being kept going for the widow until a son and daughter were able to qualify and carry it on.

PROBLEM OF A HOSPITAL STAFF

Another relates to the conditions of insurance practice at one of the hospitals in London, now under the control of the London County Council. This case was heard by the medical service subcommittee for London, and reported to the main committee last April. The decision was :—

> "That the committee are of opinion that there has been a complete failure on the part of the practitioner referred to in case M32/15 as Dr. A. to comply with the terms of service for Insurance Practitioners, either personally or by deputy, in respect of the insured persons for whose treatment he has accepted responsibility under the National Health Insurance Acts, and that the practitioner, the Approved Society, and the Minister of Health be so informed."

It should be noted here that no penalty—either caution, censure, or deduction from remuneration—is suggested. The case is interesting, and largely depends upon the right of an insured person to choose his own doctor. Shortly, the facts, as given in the report, are as follows :—

Most of the nursing staff of this hospital are insured persons, and as such have chosen the medical superintendent as their insurance practitioner. It has always been the custom for this hospital to attend to its staff gratuitously, and, if need be, to admit them to the wards. The duty of looking after all the staff (including the non-insured staff) has always been carried out by the senior assistant medical officer, who is now the surgeon specialist to the hospital, and as such is now no longer under the control of the medical superintendent. The complaint arose from an approved society. The society received a claim from one of its members on the hospital staff with a certificate, signed by the surgeon specialist, which was not on the proper medical form (Form Med. 40) but was as follows :—

> This is to certify that {Nurse / Sister} .....
> is off duty owing to ill-health.
> Taken off duty.....
> Resumed duty.....
> Signature.....

The doctor was asked to supply a certificate on the proper form, but stated he was not an insurance practitioner, and he had a deep-rooted professional objection to stating on a certificate what was the matter with a patient, since that was a confidential piece of information. The society made the following points :—

1. The record card of the member could not, from the certificate in question, record the nature of the incapacity.
2. There was no indication whether the case was one for compensation.
3. Owing to the length of illness and absence of diagnosis the society could not tell whether the case should be sent for examination by a referee.

The society also stated that a certificate had been given three weeks in advance in connexion with the period of recuperation.

The report goes on to say that from the evidence submitted it appears that at the passing of the Act there was a discussion between Dr. A. (the superintendent) and Dr. B. (the senior assistant, now surgeon specialist) with regard to one of them accepting service under the Act in connexion with the treatment of the insured staff of the hospital. Apparently, neither was willing to accept service under the Act, but it was realised that if they did not do so the capitation fees payable in respect of medical treatment of the insured staff would be lost to the institution. It was eventually agreed that Dr. A., the superintendent, should enter into an agreement with the insurance committee that the money received by him under that agreement should be allocated to a fund for the benefit of the staff of the hospital, and that Dr. B. should continue to give the medical attendance as before—of course gratuitously. This arrangement has continued until the present time.

The question arose as to whether nurses or other members of the staff were entitled to medical treatment from the staff as of right. It was agreed that they receive it at this hospital as elsewhere—as of long-standing custom—and that it is the practice in such institutions for treatment to be provided by a particular member of the staff. The committee concluded from this statement that Dr. A., as administrative head of the hospital, is ultimately responsible for seeing that members of the staff receive any medical care and attention they require, and that the particular officer giving that care is really acting as

deputy of the medical superintendent. If this is correct, and the medical superintendent is also the insurance practitioner for the institution, it is a somewhat intricate matter to differentiate between the occasions when the medical officer providing treatment acts as deputy for the superintendent, qua superintendent, and occasions when he acts as deputy for him, qua insurance practitioner.

THE ARGUMENTS

The committee pointed out to Dr. A., the superintendent, that by his terms of service he is required to provide all treatment personally, except where he is prevented by urgency of other professional duties, temporary absence from home, or other reasonable cause, and that in these circumstances he is required to appoint a deputy to act for him. But here neither Dr. A. nor Dr. B. would agree that Dr. B. was deputy to Dr. A.; and certainly at the time of the complaint Dr. A. had no control over Dr. B., and he could not, therefore, officially order him to act as his deputy. On this question whether Dr. B. can be regarded as Dr. A.'s deputy the committee say they wish to make it quite clear that neither the text nor spirit of the regulations allow one to suppose that a practitioner is carrying out his obligations if he never gives any personal service. The terms of service presume that the services of a deputy shall be occasional rather than perpetual, but Dr. B. definitely repudiated the suggestion that he had ever acted as deputy for Dr. A., and said he had made it clear from the outset that he would have nothing to do with the Act.

The arguments on the other side were as follows. Dr. A. said he was quite willing to attend the insured staff and give the proper certificates if they asked him to do so, but in fact they hardly ever did ask him. They knew that his duties were administrative rather than clinical, that Dr. B. was a much better clinician than he was, and that it was clearly in the interests of the patients to be attended by Dr. B. rather than by him, and that the latter had always carried out the work in a highly satisfactory way. The committee formed the impression that it would be embarrassing to Dr. A. if the insured patients of the staff in any number were to apply direct to him, and insist upon being medically treated by him. They sum up by saying that it is apparent that Dr. A. has never had any serious intention of carrying out any of the duties which devolved upon him under the agreement into which he entered with the committee. He admitted that (with one or two exceptions) he had never done so in person or by deputy, and they conclude that his undertaking to give service under the Acts is a mere pretence—an ingenious device to secure to a fund for the enjoyment of the staff of the hospital the money which would otherwise be paid to an insurance practitioner in respect of their treatment. They do not doubt, however, that he was acting in perfectly good faith, and in no sense for his personal benefit and gain.

To connive at such a device as that which the report discloses would be to admit a form of contracting-out free from the conditions (especially that relating to certificates) which have always been insisted upon when insured persons have been allowed to make their own arrangements for medical benefit.

POINTS IN APPEAL

The practitioners in this case have decided to appeal against the committee's decision, and it is understood the hearing will take place quite shortly. The difficulty in this class of case is one of which the medical profession is well aware. An insured person has the right to go to any doctor he or she likes. If he consults his panel doctor—the doctor of his choice—he gets his treatment free; but if he goes to some other doctor he will have to pay. In consequence, although the practice is by no means uncommon, financial considerations usually prevent an insured person from choosing one doctor and getting treatment from another, but in this hospital case money does not enter into it. The insured person is getting perfectly good treatment without payment from a non-panel doctor, the only thing he is not getting—and which is the cause of the trouble—is a particular form of certificate which the society want before they are willing to pay benefit. This seems to be entirely a matter for the society to decide. They can refuse to pay benefit if they are not satisfied with the evidence the member produces, but apparently they prefer to bring a charge against a doctor of failing to do his work when their members do not even consult him to enable him to do this work.

The result of the appeal will be awaited with much interest.

MEDICAL NEWS

University of London

Forthcoming lectures.—Five Heath Clark lectures on the Teaching of Preventive Medicine in Europe will be given by Dr. Carl Prausnitz, professor of hygiene in the University of Breslau, at the London School of Hygiene and Tropical Medicine at 5 P.M. daily from Oct. 17th to 21st.—One lecture on Some Recent Work on Filtrable Viruses and its Significance will be given by Dr. S. P. Bedson at 5 P.M. at the London Hospital Medical College on Friday, Oct. 14th.—At University College Dr. R. J. Lythgoe will lecture on the Physiology of the Sense Organs at 5 P.M. on Mondays, from Oct. 10th to Nov. 14th, and Mr. G. F. Marrian, D.Sc., on the Chemistry of the Hormones at 5 P.M. on Fridays, Oct. 14th to Nov. 4th.—At King's College Mr. J. W. Pickering, D.Sc., will give four lectures on Blood Plasma and Platelets at 5 P.M. on Tuesdays, from Oct. 11th to Nov. 1st, and Mr. W. Robson, D.Sc., four lectures on the Metabolism of Carbohydrates, Fats, and Proteins, at the same hour on Thursdays, from Oct. 13th to Nov. 3rd.—In December Dr. Davidson Black, professor of anatomy in the Peiping Union Medical College, China, will give two lectures, at University College, on Sinanthropus.

Gresham College

Four lectures on Health and Industry will be given by Sir George Newman at Gresham College, Basinghall-street, London, E.C., daily from Oct. 4th to 7th at 6 P.M.

Fellowship of Medicine and Post-Graduate Medical Association

A fortnight's course in cardiology will be given at the National Hospital for Diseases of the Heart from Oct. 10th to 21st, and a course in general medicine and surgery at the Miller General Hospital, Greenwich, from Oct. 17th to 29th. The whole of each day will be occupied with demonstrations, operations, and lectures, and the course is arranged primarily for general practitioners. Three week-end courses, each occupying the whole of Saturday and Sunday, will be given during October as follows: Oct. 8th and 9th, at the Brompton Hospital, in diseases of the chest; Oct. 15th and 16th, at the Royal Albert Dock Hospital, in clinical surgery; and Oct. 29th and 30th, at the City of London Maternity Hospital, in obstetrics. A morning course will be given at the Hospital for Sick Children, Oct. 24th to Nov. 5th; from Oct. 31st to Nov. 26th there will be lectures at 5 P.M. daily at the West End Hospital for Nervous Diseases; and from Oct. 31st to Nov. 19th there will be an afternoon course at the Royal Westminster Ophthalmic Hospital. A series of afternoon lectures on renal disease will be given on Tuesdays at 4 P.M., from Oct. 18th, at the Medical Society of London; these lectures are free to members of the Fellowship. The other courses are open only to members. A panel of teachers prepared to give clinical instruction is available, and clinics may be attended by arrangement with the Fellowship, from which further details may be had at 1, Wimpole-street, London, W.1.

British College of Obstetricians and Gynæcologists

On Monday, Dec. 5th, at 3 P.M., the new house of this College, 58, Queen Anne-street, London, W.1, will be opened by the Duchess of York. The Duke and Duchess will afterwards be made honorary Fellows.

Pharmaceutical Society of Great Britain

The ninety-first session of this society's school of pharmacy will be opened on Wednesday, Oct. 5th, at 3 P.M. Mr. C. W. Kimmins, D.Sc., late chief inspector of the education department of the London County Council, will give an inaugural address.

Chelsea Clinical Society

The annual dinner of this society will be held at Claridge's Hotel, on Tuesday, Oct. 18th. Sir Henry Curtis-Bennett, M.P., Mr. George Belcher, and Mr. L. Hore-Belisha, M.P., will be the principal guests.

New Nurses' Home at Barnsley

On Thursday last week the Princess Royal opened a new nurses' home at the Kendray infectious diseases hospital of the Barnsley corporation. She then inspected the whole of the institution, and afterwards paid a surprise visit to the Barnsley Beckett Hospital.

St. Peter's Hospital for Stone

A post-graduate course will be held at this hospital from Monday, Oct. 24th, to Saturday, the 29th. There will be lectures and demonstrations every morning and afternoon. A full syllabus may be had from the secretary of the Hospital, Henrietta-street, Covent Garden, W.C.2.

Medical Society of Individual Psychology

On Thursday, Oct. 13th, at 8.30 P.M., at 11, Chandos-street, London, W., Dr. Leonhardt Seif, of Munich, will give an address entitled the Individual and the Community. The meeting will be open to members of the medical profession. On Nov. 10th Dr. J. S. Fairbairn will open a debate on Psychology in Gynæcological and Obstetric Practice. Further particulars of the society's meetings may be had from the hon. secretary, Dr. F. G. Crookshank, 57a, Wimpole-street, London, W.

Manchester Royal Infirmary Post-graduate Course

A post-graduate course on medical, surgical, and special subjects is again being given this winter at the Manchester Royal Infirmary. There will be lectures on Tuesdays at 4.15 P.M. until Dec. 13th; on Fridays at 4.15 P.M., until Dec. 16th, demonstrations of clinical cases and methods will be given in the wards and special departments.

The Lloyd Roberts lecture will be given by Sir William Bragg, F.R.S., at the University of Manchester on Nov. 15th. His subject will be the Crystal Structures of Living Matter. On that day there will be no post-graduate lecture.

Chartered Society of Massage and Medical Gymnastics

The fourth annual dinner of this society was held in the Connaught Rooms on Sept. 22nd, Mr. R. C. Elmslie, the president, being in the chair. In response to the toast of the society proposed by Dr. O'Donovan in happy terms, he spoke with justifiable pride of its progress and achievements before and since incorporation. It now had well over 7000 members, and represented an organised body of those skilled in physical treatment which had no rival in the world. The question of official registration and protection was a thorny one. Whereas the definition of dentistry or of midwifery was comparatively easy, the definition of massage and physical treatment was difficult to frame, for skill and experience in luxury massage and beauty massage was possessed by many who were not entitled to recognition as persons suitable for carrying out remedial massage. There was some hope that with the coöperation of the Council of the British Medical Association, the Society of Apothecaries, and other bodies some more central form of registration would be achieved, for members of the society had well established their claim to recognition by the medical profession. Mrs. Guthrie Smith enumerated the distinguished guests, finding an appropriate word for each, Miss R. H. Greenall and Dr. Cecil Wall, master of the Society of Apothecaries, responded. Miss Greenall, the head of the Bergman Osperberg Physical Training College, Dartford, spoke of the valuable corrective provided by remedial work to the somewhat too robust and bracing attitude occasionally adopted by students leaving physical training schools, and Dr. Wall supported the hope of the president that authoritative registration might soon be established for practitioners of massage and physical treatment. Sir William Hale-White proposed the health of the chairman as a worthy successor to Sir Cooper Percy, and the toast was acclaimed with musical honours.

Surgical Instrument Manufacturers' Association

The annual dinner of this association will be held at the Holborn Restaurant on Friday, Oct. 14th.

The Physical Society

The Optical Society and the Physical Society of London have amalgamated under the name of the Physical Society. At the first meeting of the new session, to be held at the Imperial College of Science and Technology at 5 P.M. on Friday, Oct. 7th, Mr. J. W. French will speak on the Manufacture of Optical Glass.

Extension of Bishop's Stortford Hospital

Enlargements of this hospital, which have cost £20,000, were informally opened last week. In addition to the new buildings the old portion has been modernised, and the accommodation has been increased from 30 to 61 beds, with a new theatre, X ray, sun ray, and massage departments.

Leicestershire Tuberculosis Sanatorium

Sir George Newman last week opened the new tuberculosis sanatorium and isolation hospital, which has been erected by the Leicestershire county council at Markfield at a cost exceeding £106,000. The building stands in beautiful surroundings on the edge of Charnwood Forest, more than 500 feet above sea-level. The hospital has 54 beds, and the sanatorium 126.

Derby Isolation Hospital

The Mayor of Derby, Alderman W. H. Salisbury, has opened extensions which have cost £45,000. The chief addition is a cruciform observation block with 24 glass-screened cubicles, all of them visible from the central duty-room. A nurses' home with accommodation for 32 nurses, a new ward for tuberculous children, and a large recreation hall have also been added.

Attack on a Medical Man

Dr. Joseph Power, of Ardfinnan, County Tipperary, who is chairman of the Irish Medical Committee, was recently the victim of an assault in his dispensary. Giving evidence in court, Dr. Power stated that the patient, James Durney, entered the dispensary partly under the influence of drink and in a very rowdy condition. When he refused to give a certificate Durney took off his coat and tried to strangle him. In court Durney is alleged to have said he was sorry that he had not succeeded in killing Dr. Power, and to have accused the justice of partiality. Durney was sentenced to one month's hard labour, and then to give security for good behaviour.

Swansea Contributory Scheme

The Swansea Hospital Board has adopted a contributory scheme based upon a minimum contribution of 2*d.* per week, or alternatively 1*d.* in the pound or part of £1. Unattached workers and domestic servants will be required to make the same contribution as other employees; but for convenience, this may be paid either quarterly, half-yearly, or yearly, in advance. Contributions paid yearly in advance will be subject to a discount, the minimum amount payable being 4*s.* per annum. To put the scheme on a sound financial basis, a weekly contribution of 3*d.* per head is required, but on account of the industrial depression each contributing member is asked to pay, for the present, a minimum of 2*d.* per week. Patients under the scheme will be classified in three income limits—£4, single or widowed persons; £5, married without dependents; and £6, married or widowed with dependents, and up to these income limits no payment will be sought. For persons whose income exceeds these limits there will be a charge of 4 per cent. of the amount by which the person's income exceeds the limit, and for those who are found to require a major operation an additional charge of 50 per cent. of the basic figure will be made.

Appointments

BRITTAIN, H. A., M.Ch. Dub., F.R.C.S. Eng., has been appointed Honorary Assistant Surgeon, Norfolk and Norwich Hospital.

LISHMAN, F., M.D., C.M. Edin., Certifying Surgeon under the Factory and Workshop Acts for the Crook District of the County of Durham.

Queen Charlotte's Maternity Hospital: SCOTT, J. M., M.B., B.S., Senior Resident Medical Officer. PARKER, J. L., M.B., B.Ch., Assistant Resident Medical Officer. CARLESS, Miss E. M., M.R.C.S., D.P.H., District Resident Medical Officer.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MIDDLESEX HOSPITAL POST-GRADUATE COURSE.

MONDAY, Oct. 3rd.—10.15 A.M., Mr. E. W. Riches: Prostatic Obstruction with special reference to Per-urethral Operations. 11.30 A.M., Prof. Samson Wright: Some Recent Advances in Physiology and their Application to Medicine and Surgery. 2.30 P.M., Dr. G. E. Beaumont: The Modern Treatment of Pulmonary Tuberculosis (demonstration).

TUESDAY.—10.15 A.M., Discussion to be introduced by Mr. E. Pearce Gould: The Treatment and Results in Mal-descent of the Testicle. 11.30 A.M., Dr. G. E. S. Ward: Drugs in the Treatment of Heart Disease. (The course is open only to graduates of the school.)

ST. THOMAS'S HOSPITAL POST-GRADUATE COURSE.

MONDAY, Oct. 3rd.—10 A.M., Mr. W. H. C. Romanis: Diagnosis of the Acute Abdomen. 10 A.M., Dr. G. Fildes: Radiography of the Colon. 11.15 A.M., Dr. Z. Mennell: Anæsthesia (demonstration). 11.15 A.M., Prof. L. S. Dudgeon: P.U.O. (demonstration). 2 P.M., Dr. H. L. Tidy: Medical round. 2 P.M., Mr. C. A. R. Nitch: Surgical round.

TUESDAY.—10 A.M., Dr. H. L. Tidy: Recent Work on Anæmia. 10 A.M., Mr. B. W. Williams: Recent Advances in Radiotherapy. 11.15 A.M., Dr. G. T. Hebert: Pneumothorax (demonstration). 11.15 A.M., Mr. J. M. Wyatt: Antenatal (demonstration). 2 P.M., Dr. M. A. Cassidy: Medical round. 2 P.M., Mr. B. C. Maybury: Surgical round.

WEDNESDAY.—10 A.M., Dr. J. L. Birley: Neuralgia and its Treatment. 10 A.M., Mr. R. H. O. B. Robinson: Surgery of the Chest. 11.15 A.M., Dr. H. Gardiner-Hill: Pituitary Diseases (demonstration). 11.15 A.M., Mr. Max Page: Treatment of Fractures (demonstration). 2 P.M., Mr. W. R. Bristow: Orthopædic round. 2 P.M., Dr. R. C. Jewesbury: Pædiatrics round.

THURSDAY.—10 A.M., Mr. C. A. R. Nitch: Pyelography. 10 A.M., Prof. O. L. V. de Wesselow: Diabetic Coma. 11.15 A.M., Dr. M. A. Cassidy: Orthocardiography (demonstration). 11.15 A.M., Dr. J. B. Mennell: Physicotherapeutics (demonstration). 2 P.M., Dr. J. P. Hedley: Gynæcological round. 2 P.M., Dr. J. L. Birley: Neurological round.

FRIDAY.—10 A.M., Sir Percy Sargent: Surgery of the Sympathetic Nervous System. 10 A.M., Dr. Henry Yellowlees: Diagnostic Pitfalls in Psychiatry. 11.15 A.M., Mr. P. H. Mitchiner: Treatment of Burns; Tannic Acid (demonstration). 11.15 A.M., Mr. W. G. Howarth: Throat and ear clinic. 2 P.M., Dr. J. Forest Smith: Medical round. 2 P.M., Mr. W. H. C. Romanis: Surgical round. (This course is open only to graduates of the school.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 3rd, to SATURDAY, Oct. 8th.—METROPOLITAN HOSPITAL, Kingsland-road, E. Post-graduate course in General Medicine and Surgery. All day. 10.30 A.M. to 5.30 P.M. Especially suitable for general practitioners.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Afternoon course in Dermatology. Daily clinics at 2 P.M. and 6 P.M.—Lectures Tues. and Frid.—CENTRAL LONDON THROAT AND EAR HOSPITAL, Gray's Inn-road, W.C. All day Clinical Course in Diseases of the Ear, Nose, and Throat. Also Operative Surgery, Peroral Endoscopy, Pathology classes (strictly limited).—GORDON HOSPITAL, Vauxhall Bridge-road, S.W. Afternoon course in Proctology. Demonstrations, operations, and lectures.—LONDON LIGHT CLINIC, Ranelagh-road, S.W. Evening demonstrations on Physical Medicine. Mon. and Wed., 8 to 9 P.M.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Oct. 4th.—5 P.M., Dr. W. Griffith: Introductory.

THURSDAY.—5 P.M., Dr. J. M. H. MacLeod: Morphology and Histopathology of Elementary Lesions.

GRESHAM COLLEGE, Basinghall-street, E.C.2.

TUESDAY, Oct. 4th and following three days. Sir George Newman: Health and Industry.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, Oct. 4th.—4.15 P.M., Dr. R. S. Paterson: Radiological Examination of the Urinary Tract.

FRIDAY.—4.15 P.M., Dr. F. R. Ferguson: Demonstration of Medical Cases.

Vacancies

For further information refer to the advertisement columns

Belgrave Hospital for Children, 1, Clapham-road, S.W.—Two H.P.'s and H.S. Each at rate of £100.

Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Asst. M.O. £300.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.

Brentwood, High Wood Hospital for Children.—Asst. M.O. £350.

Brighton Sanatorium and Infectious Disease Hospital.—Jun. Res. M.O. At rate of £150.

Bromsgrove, Worcestershire Mental Hospital, Barnsley Hall.—Second Asst. M.O. £350.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Central London Ophthalmic Hospital, Judd-street, W.C.—Asst. Surgeon.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Great Barrow.—H.P. At rate of £100.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Colindale Hospital, Colindale-avenue, N.W.—Sen. Asst. M.O. £500.

Coventry and Warwickshire Hospital.—Res. H.S. £125.

Dublin, Mercer's Hospital.—Hon. Visiting Surg.; also Radiologist.

Durham County Hospital.—Second H.S. £150.

East London Hospital for Children, &c., Shadwell, E.—Asst. Surgeon to Nose, Throat, and Ear Dept. Res. H.P. £125. Also Asst. Physician. £40.

Farnborough Institution Hospital, Kent.—Res. Asst. M.O. £250.

Halifax Royal Infirmary.—Third H.S. At rate of £150.

Hampstead General and North-west London Hospital, Haverstock Hill, N.W.—H.S. At rate of £100.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. Res. M.O. At rate of £150. Three H.P.'s, H.S., and Jun. H.P. Each at rate of £50.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P. At rate of £150 and £100 respectively. Also Hon. Anæsthetist.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Anæsthetist. £50.

Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.

Hull Royal Infirmary.—Hon. Radiologist.

Huntingdon County Hospital.—H.S. £125.

Leeds Hospital for Women.—H.S. At rate of £100.

Leeds Maternity Hospital, Hyde-terrace.—Sen. and Jun. H.S.'s. At rate of £52 and £26 respectively.

Liverpool, David Lewis Northern Hospital.—Hon. Gynæcological and Obstetrical Surgeon.

London County Council.—Asst. M.O. £475. Asst. Aurist for P.H. Dept. 34s. 6d. per session. Also Temporary District M.O.'s. At rate of £156 and £150.

London Hospital, E.—Surg. First Asst. and Reg. £300.

Lowestoft, St. Luke's Hospital.—Sen. Asst. M.O. £500.

Manchester, Ancoats Hospital.—Asst. Pathologist. £200. Also H.S. At rate of £100.

Manchester, Park Hospital, Davyhulme.—Visiting Phys. and Pathologist.

Manchester, Royal Children's Hospital, Pendlebury.—Res. M.O. At rate of £125.

Manchester, Royal Children's Hospital.—Asst. M.O. for Out-patients' Dept. At rate of £150.

Manchester, St. Mary's Hospitals.—Two H.S.'s for Whitworth-street West Hospital. Each at rate of £50.

Medway Institution Hospital, Kent.—Res. Asst. M.O. £250.

Metropolitan Hospital, Kingsland-road, E.—Sen. and Jun. H.P.'s and two Cas. O.'s. Each at rate of £100.

Miller General Hospital, Greenwich-road, S.E.—Hon. Surgeon to Nose, Throat, and Ear Dept.

Monmouthshire County Council.—Asst. M.O. £500.

Paddington Green Children's Hospital, W.—H.S. At rate of £150.

Park (Fever) Hospital, Hither Green, S.E.—Res. Med. Supt. £1100.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—Hon. Asst. Surgeon to Nose, Throat, and Ear Dept.

Radium Institute, Riding House-street, W.—H.S. At rate of £150.

Rotherham Hospital.—H.P. £180.

Royal Army Medical Corps.—Twenty-five Permanent Commissions.

Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S. At rate of £100.

Royal London Ophthalmic Hospital, City-road, E.C.—Sen. Res. O. At rate of £150.

St. George's Hospital, S.W.—Surgeon and Asst. Surgeon.

St. Mary's Hospital for Women and Children, Plaistow, E.—Res. and Asst. Res. M.O.'s. At rate of £175 and £120 respectively.

Southampton, Royal South Hants and Southampton Hospital.—Hon. Clin. Asst.

South-Eastern Hospital for Children, Sydenham, S.E.—Jun. Res. M.O. At rate of £120.

South London Hospital for Women, South Side, Clapham Common, S.W.—Anæsthetist. 10s. 6d. each attendance.

Southport General Infirmary.—Sen. and Jun. H.S. £200 and £150 respectively.

Stafford, Staffordshire General Infirmary.—H.S. and H.P. At rate of £200 and £150 respectively.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. Res. H.S. and Jun. H.S. At rate of £150 and £100 respectively.

West London Hospital, Hammersmith-road, W.—Hon. Anæsthetist. Also Dermatologist and Physician.

Whitechapel Clinic, Turner-street, E.—Part-time Clin. Asst. At rate of £150.

Winchester, Royal Hampshire County Hospital.—Hon. Ophthalmic Surgeon.

Wolverhampton, Royal Hospital.—H.S. to Ear, Throat, and Nose Dept. At rate of £100.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Tynemouth (Northumberland) and Machynlleth (Montgomeryshire).

NOTES, COMMENTS, AND ABSTRACTS

PHRENICECTOMY IN THE TREATMENT OF PULMONARY DISEASE *

WITH AN ANALYSIS OF FIFTY-EIGHT CASES

BY LAURENCE O'SHAUGHNESSY, M.D. DURH., F.R.C.S. ENG.

COLLEGE RESEARCH SCHOLAR, ROYAL COLLEGE OF SURGEONS OF ENGLAND; LATE SENIOR MEDICAL INSPECTOR, OMDURMAN

PHRENICECTOMY is a comparatively modern procedure, for, although some animal experiments were done as long ago as 1890, it was not till 1911 that Stuertz [1] proposed to carry out the procedure in man. In 1913 Sauerbruch [2] reported five cases in which the operation had been done with some measure of success. Its effect should be paralysis of the diaphragm, but it was soon found that section of the nerve frequently failed to produce this result. The cause of this remained unknown until Felix [3] and Goetze [4] in 1922 found that there was often an accessory phrenic nerve which pursued an independent course into the thorax to join the main stem.

To obtain a certain paralysis Felix proposed the operation of phrenic avulsion in which, after exposure of the nerve in the neck, it is grasped with forceps, and by traction a considerable length of it drawn out from the thorax until it finally breaks. In this way the connexion between the main trunk and its accessory branch is broken. Goetze advocated what he termed the radical operation, in which the cervical plexus is exposed and the roots of the nerve identified and cut, as well as the nerve to the subclavius and any other twigs which appear to be taking a similar course.

There are certain theoretical objections to the blind and forcible avulsion of the nerve from the thorax. It is conceivable that the nerve might be adherent to some diseased portion of the lung, and so a laceration might result. Also the tearing of other adhesions might cause hæmorrhage. In practice the danger is slight. In the event of extreme pain attending attempted avulsion it would be expedient to abandon it and carry out the operation of Goetze, but as this is technically difficult, and as excellent results are obtained by the simpler procedure, phrenic avulsion at present holds the field.

THE VALUE OF PHRENICECTOMY

Phrenicectomy has been chiefly used in pulmonary tuberculosis: in unilateral disease with a tendency to fibrosis; as a last resort in acute caseous tuberculosis; as a palliative measure in obviously incurable cases to relieve cough, vomiting, and also hæmoptysis; and as a preliminary to thoracoplasty. Many advocate it in combination with artificial pneumothorax.

Sauerbruch condemns the operation almost entirely as an individual measure, and considers that its main indication is as a preliminary to thoracoplasty. He states [5] that of 185 cases of pulmonary tuberculosis in which phrenicectomy was the sole treatment, only 15 are surviving and at work, and of these five had solitary lesions at the base. Morriston Davies,[6] who reported on 33 cases, states that 16 showed marked improvement; four of these cases were intended for thoracoplasty on account of extensive disease, but so great was their improvement after phrenicectomy that further intervention became unnecessary. Moore [7] reports that two out of ten cases are well, and five improved. Welles,[8] who reports on 271 cases, states that 174 (64 per cent.) were improved.

Of the phrenicectomies described in this report, 53 were carried out as the main therapeutic measure for pulmonary tuberculosis. It has been possible to trace 32, of whom 3 are "cured," 9 have improved, 7 are worse, and 13 have died. The series includes some recent cases which are of little value as an index of the ultimate worth of the procedure. The term "cure" is used for cases in which, in addition to general improvement, expectoration of tubercle bacilli has ceased. It is to be interpreted with caution, as one of the fatal cases spent a year in this state before a final collapse.

There have been occasional dramatic results in acute, highly febrile caseous types of tuberculosis, notably by Goetze,[9] Frisch,[10] and Brunner.[11]

All authorities are agreed that the procedure has considerable value in the treatment of such symptoms as irritative cough and vomiting. When more radical measures of pulmonary compression are not available, Davies [6] and others have had good results in cases of hæmoptysis.

Phrenicectomy can usefully be combined with artificial pneumothorax and (see Case 7 below) can be used as a preliminary measure in a patient who is too ill to bear thoracoplasty.

ITS POSSIBLE DANGERS

Sauerbruch has issued an impressive warning as to the dangers of the operation itself. He described three cases of severe hæmorrhage in which ligature of the subclavian artery was required, and two of these cases were fatal. He also mentioned the danger of air embolism and wounds of the thoracic duct. The literature contains no other record of such accidents, except that Welles [8] injured the thoracic duct in one case, but this had no serious consequences. Davies in a series of 108 cases had no fatality. The only death reported as a result of phrenicectomy, apart from purely operative complications, is by Davidson and Ledlie.[12] It was assumed that sudden compression of the base of the lung had led to general dissemination of an intense pneumococcal infection.

A SERIES OF FIFTY-EIGHT CASES

In 1926 I was working in an out-station in the Sudan where phrenicectomy appeared to be a form of collapse therapy suitable for the somewhat primitive conditions. In the absence of an X ray apparatus, air replacement or thoracoplasty was clearly impossible. Phrenicectomy merely demanded an operating theatre and some knowledge of surgical technique. The method employed was that described by Davies,[13] in which the nerve is exposed by a transverse incision as it lies on the scalenus anterior, cut, seized with artery forceps, and gradually avulsed. Anatomical variations may add difficulty—for example, the nerve at times descends vertically along the inner border of the scalene instead of pursuing its normal oblique course.

Although the patients were in many cases poor surgical material, the only local complication was a hæmatoma which delayed healing for a few days. No attempt was made to select cases suitable for cure, as even in the worst cases it was hoped to obtain some symptomatic relief. Thirty-three of the cases were followed to Jan. 31st, 1931. All these had tubercle bacilli in the sputum along with general symptoms of pulmonary tuberculosis. Five were bilateral,

* Extract from M.D. thesis in the University of Durham.

and in one the phrenicectomy was supplemented by artificial pneumothorax. As a whole the results are not encouraging, as only three "cures" are reported, and the course of the next few years may remove these from this category. At the same time some of the nine cases who have improved will probably become "cures." One or two of the results were unexpectedly good, and several cases were restored to normal health for a year or more before their final relapse.

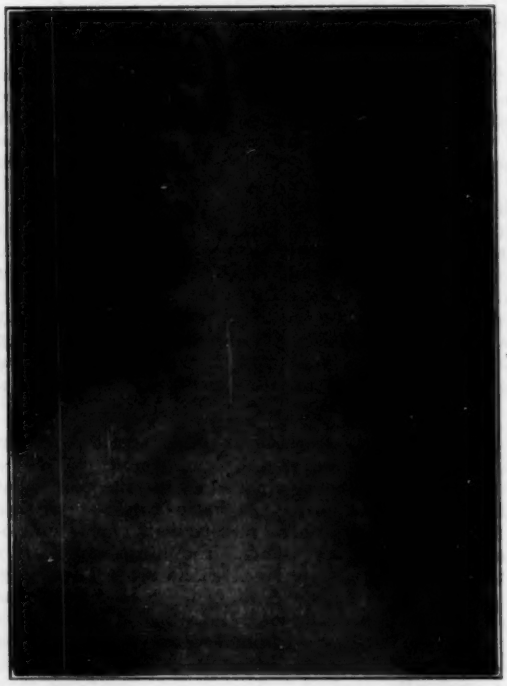
Of 23 other patients, some of whom were observed for some months, the ultimate fate is unknown. In many of these cases there was improvement in symptoms, such as irritable cough. Two cases of bronchiectasis did not benefit from phrenicectomy.

BILATERAL PHRENICECTOMY

In four cases bilateral paresis of the diaphragm was induced, and in the first of these I can give a record of the post-mortem findings a year later.

CASE 1.—A Sudanese woman of 25 years complained of cough and fever. She lived in a village on the Nile some two hundred miles south of Omdurman in a malarial district. On examination there was no splenomegaly or other evidence of malaria, but the patient was very emaciated. There was evidence of consolidation at the right apex, and scattered and persistent râles at the right

FIG. 1



Radiogram showing high position of diaphragm after bilateral phrenicectomy (Case 1).

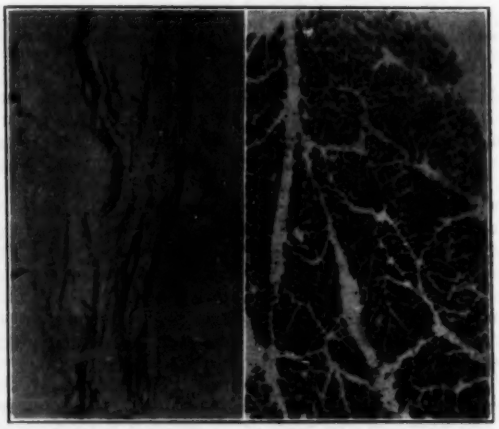
base and throughout the left lung. The sputum contained tubercle bacilli.

On August 4th, 1929, a right phrenic avulsion was done, and the fluoroscope showed a high diaphragm on the right side which exhibited paradoxical movement.

On Oct. 1st, little general improvement having occurred and signs persisting at the left base, the left phrenic nerve was avulsed. There was an immediate rise of respiration-rate to 38, the pulse became weak, and there was slight collapse. All the accessory muscles of respiration were brought into play. The acute symptoms subsided after an injection of atropine. Careful examination failed to reveal any sign of pulmonary œdema or collapse. Next day respiration was less tumultuous, and the rate had fallen to 28. The pulse was normal, and there was no alteration of physical signs in the chest.

On Oct. 15th the patient felt perfectly well and wished to leave hospital. The fluoroscope showed complete paralysis of the diaphragm (Fig. 1). The further course was one of continued improvement. She appeared to suffer no incon-

FIG. 2



Left: Section of diaphragm a year after phrenicectomy (Case 1). Right: Section of normal diaphragm for comparison.

venience from the loss of the activity of her diaphragm. Coughing took place normally, there was no dyspnœa even after ascending stairs, and there were no signs of impaired circulation. There was no complaint of dyspepsia, and her alimentary system functioned in every way normally. The scattered râles at both bases disappeared; the evidence of consolidation at the right apex persisted, but the encircling zone of crepitations disappeared. Two months later the sputum no longer contained tubercle bacilli and, although there had been little gain in weight, the general condition was very good. Later, her condition having further improved, she was employed as a hospital cleaner.

On Dec. 1st, 1930, she had a severe hæmoptysis and was readmitted to hospital. There was evidence of progressive disease in the left lung, and the lesion at the right apex appeared active. The patient became progressively worse, further hæmorrhages took place, and she died on Dec. 30th.

The following were the *post-mortem* findings: Both pleural spaces were largely obliterated by adhesions. There was extensive fibro-caseous tuberculosis throughout both lungs, with a small cavity in the right upper lobe which contained recent blood clot. There was marked atrophy of the whole diaphragm (Fig. 2). The other organs appeared normal.

It is difficult to avoid the conclusion that the course of the disease was favourably influenced by the phrenicectomy. The patient was enabled to enjoy a year of normal life, although on admission the prognosis seemed almost hopeless.

CASE 2.—Phrenicectomy was done for disease affecting the right upper lobe. There was some temporary improvement, but six months later evidence of marked disease in both lungs was found, together with tuberculosis of the larynx. The condition was clearly hopeless, but a constant irritable cough added greatly to the patient's suffering, and in the hope of alleviating this the left phrenic nerve was avulsed.

Dyspnœa and marked distress appeared as soon as the nerve was cut across, and persisted until the patient died five days later. The cough did not recur, and even voluntary coughing was impossible.

Sauerbruch has emphasised the fact that paralysis of the diaphragm, while it may allay an irritative cough, does not affect the act of voluntary coughing; in the other three cases recorded here the power of voluntary coughing was retained, but in this case it was certainly lost. There was no alteration in the

physical signs to explain the dyspnœa. There was no evidence of pulmonary œdema or collapse, but it seemed clear that although death was inevitable the intervention had hastened its advent.

CASE 3.—This patient had extensive bilateral disease, and bilateral phrenicectomy was done, a month intervening between the two operations. As in the other cases, there was an increase in respiration-rate, and the accessory muscles of respiration came into play. In a few days the respiration-rate fell to 20, the accessory muscles no longer showed activity, and quiet respiration of intercostal type was present. The fluoroscope showed total paralysis of the diaphragm.

The operation in this case is of too recent date for assessment as a therapeutic measure. At the same time, it is of interest to note that the respiratory, circulatory, and alimentary systems continue to work normally in the complete absence of diaphragmatic function.

CASE 4.—Phrenicectomy was done for a lesion in the right upper lobe; six weeks later signs appeared in the other lung, and it was decided to paralyse the diaphragm on that side. The nerve was exposed and crushed. There was no dyspnœa, but an increase in respiration-rate. On examination with the fluoroscope a high immobile diaphragm was seen. Six months later the left diaphragm was again working, but the right half remained motionless.

This patient appears to have derived benefit but, although his condition has improved, bacilli are still present in the sputum. Temporary paralysis can only be obtained by this method in patients without an accessory phrenic nerve.

FATAL CASES

Three of my cases illustrate the danger of phrenicectomy in patients who are acutely ill.

CASE 5.—This patient was admitted complaining of severe hæmoptysis. There was evidence of consolidation of the right upper lobe, and the sputum contained tubercle bacilli. The hæmorrhage was severe, and clearly threatened life. Two attempts to induce artificial pneumothorax failed, as no free pleural space could be found.

On Dec. 23rd, 1929, as a last resort, the patient being very exhausted and having air-hunger, the right phrenic nerve was avulsed. There was no immediate dyspnœa, but half an hour later this appeared and there was marked general distress. On examination there were scattered moist râles throughout the left lung, and the expectoration of pink frothy sputum showed that acute œdema of the lung was present. The usual remedies failed, and very shortly the patient died.

The following were the *post-mortem* findings: The right pleural space was largely obliterated by adhesions, but the left pleural space was free. There was consolidation of the upper lobe of the right lung, with a small central cavity. The cavity was the size of a walnut and, on removing the contained clot, erosion into a large vessel could be seen. There were scattered areas of fibro-caseous tuberculosis in the middle and lower lobe of this lung, but no evidence of œdema. The left lung showed no evidence of tuberculosis, but was completely œdematous. No portion of the organ contained any air. The other organs appeared normal except for marked engorgement of the right heart.

No case of this type has been recorded. It is impossible to explain the relation of the phrenicectomy to the development of pulmonary œdema, but equally impossible to avoid the conclusion that it was the determining factor. The absence of œdema on the operated side is remarkable, as there was enough normal tissue in the lower lobe to allow of its recognition. It is held by Dunner[14] and others that changes in the pulmonary circulation follow phrenicectomy, and the findings in this case may have some relation to his theory. Another point of interest was the site of the hæmorrhage, which was so placed in the midst of unyielding tissue that no form of collapse therapy could possibly have influenced it.

CASE 6.—This woman was admitted with advanced pulmonary tuberculosis affecting both lungs. The right lung was in worse condition than the left, and the right phrenic nerve was avulsed. The operation was done in the usual way without difficulty, and the patient exhibited no sign of distress; 24 hours later there was dyspnœa of sudden onset, and examination showed that acute œdema of the lung had supervened. The physical signs were more marked in the left lung—that is, on the non-operated side. The usual remedies were applied without avail, and the patient died some hours later. An autopsy could not be obtained.

This case serves as another example of the dangers of phrenicectomy in very advanced cases, and again raises the question of its relation to the vasomotor supply of the lung.

OTHER CASES OF INTEREST

In the following case phrenicectomy was used to prepare for thoracoplasty.

CASE 7.—This patient was admitted with pulmonary tuberculosis. Clinical examination and the radiographic picture showed that the disease was almost entirely confined to the right lung. The patient was in poor condition; there was profuse expectoration and marked pyrexia. The right phrenic nerve was avulsed, with almost immediate improvement.

Six weeks later the patient had gained over a stone in weight, was apyrexial, and had much less cough. It was decided to attempt more satisfactory collapse of the lung and under spinal anæsthesia a paravertebral thoracoplasty was done, portions of the upper six ribs being removed. The patient stood the operation well and his improvement continues.

It is, of course, realised that six weeks' rest and diet would tend to improve the general condition, but it seems difficult to exclude the phrenicectomy from an important share in the transformation of a sick and emaciated patient into one sufficiently robust to withstand a major surgical operation.

Occasionally some anatomical peculiarity may lead to difficulty.

CASE 8.—The nerve was found in the usual site and sectioned, but on attempting to avulse it a distinct arterial pulsation was felt. Continued avulsion was clearly dangerous, and the operation was terminated. Examination with the fluoroscope showed no paralysis of the diaphragm, so that clearly an accessory phrenic nerve existed.

This type of case has been described by Davies, who believes that the phenomenon is due to a junction between the phrenic and its accessory immediately below the subclavian vein. He has devised a small ring-shaped instrument which is passed down along the course of the nerve to sever this connexion. It seems possible, however, that some aberrant artery within the chest may be concerned, in which case it would seem wiser to divide the accessory phrenic in the neck after the manner of Goetze.

Remarks

Phrenicectomy may be a useful therapeutic measure in certain cases of pulmonary tuberculosis; it may be of value in cases of chronic empyema and in fibrosis of the lung. It can offer little help in cases of bronchiectasis, and among the rarer indications for its use may be mentioned intractable hiccup and spasm of the diaphragm.

The operation in efficient hands is not dangerous, but in those gravely ill it may have serious or even fatal sequelæ, as some of the results in the above series show.

Considered as an individual measure for the cure of pulmonary tuberculosis its results are disappointing. Phrenicectomy is, after all, the least effective method of collapse therapy, but its use is possible under primitive conditions which preclude the use of the more radical measures. Its most useful indication is probably in cases which the ordinary methods of rest and diet just fail to control, when the slight

additional rest may incline the balance towards the healing side.

Phrenicectomy is of undoubted value in controlling symptoms caused by adhesions in the region of the diaphragm, and is a useful preliminary to the operation of thoracoplasty.

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COMPLEMENT-FIXATION TEST IN VULVO-VAGINITIS OF CHILDREN.

THE diagnosis of acute gonorrhœa in childhood is usually a matter of little difficulty. Not only are gonococci easily demonstrable in the direct smear, but the clinical picture is pathognomonic—dusky red coloration of the genital mucous membranes with eczematous crusting of the surrounding skin and profuse sticky yellow or green pus oozing from the vagina. The urethral orifice may also be œdematous and exude pus, and there is frequently a sharply demarcated reddened area around the anus. In the more chronic cases, however—and the disease is characterised by its chronicity—it may be much harder to distinguish between a vulvo-vaginitis of gonococcal origin and one that is due to other causes. The clinical picture is much less typical than that of the acute case, and the great number and variety of organisms present in smears and cultures may make identification of the gonococcus an uncertain procedure. It is therefore in the chronic case that additional aids to diagnosis would be appreciated. The complement-fixation test of Müller and Oppenheim is remarkably specific in the gonorrhœa of adults; T. E. Osmond and J. O. Oliver [1] in reporting 5000 tests found only 0·6 per cent. false positives and a high percentage of positives in all except very early cases. The value of the test in children is less definitely established, though in this country D. K. Brown [2] has reported favourably in a small series of cases. Alfred Fessler [3] has now examined the results of the test in a well-controlled series of cases, ranging in age from 2 months to 14 years, the majority being between 4 and 8 years old. He divides them into four groups: (I.) 50 control cases, free from vulvo-vaginitis; (II.) 20 cases with non-gonorrhœal vulvo-vaginitis; (III.) 50 cases in which gonococci were present in the vaginal secretion; and (IV.) 23 "follow-up" cases of gonorrhœa which had been treated and cured of their condition at least two years previously. Of the control groups (I.) and (II.), group (I.) showed 47 negatives and 3 weak positives, and Group II. 19 negatives and 1 weak positive. Group III. gave 31 positives, of which 13 were medium or weak positives. In Group IV. all cases that had been cured for more than three years gave negative results, while the remaining 11 cases showed 2 positives, 2 weak positives, and 7 negatives. Fessler concludes that the test is definitely valuable in the diagnosis of gonorrhœa in children, in spite of the relatively large number of weak positive reactions that occurred. The explanation of the difference between the value of this test in adults and in children may be that in children the disease tends to remain both localised and resistant to treatment, and thus the formation of antibodies is relatively poor. The author agrees with the majority of observers in regarding treatment by stock vaccines as ineffective.

[1] Brit. Jour. Ven. Dis., 1929, v., 281.
[2] Ibid., 1930, vi., 285.
[3] Wien. Klin. Woch., 1932, xxxv., 1064.

A BOGUS SALESMAN

WE are informed by Messrs. S. Maw, Son and Sons, Ltd., of Aldersgate-street, E.C., that doctors in London and the suburbs are receiving visits from a man who purports, without authority, to represent that firm in the capacity of a travelling salesman. The man's methods are to present a card bearing the name of the firm and to take an order for medical sundries, such as labels or charts, and collect payment. He then departs and no more is heard of him. So far, we are informed, the suggested amount seems to be up to £1, but it is of course possible that he may attempt to obtain larger sums. Up to the present the field of his activities has included Shepherd's Bush, Norbury, Fulham, Whitechapel, and Acton, and he has given his name variously as O'Connor, O'Gorman, Collins, and Hayes. He is said to speak with an Irish accent.

Practitioners who receive visits from the man to whom this warning relates should be on their guard and, for the protection of others, may consider a discreet communication with the police.

REMOVABLE POCKETS

Dr. Percy Edgelow has demonstrated to us a pocket which he has devised for coat and trousers, capable of being removed, cleansed, and disinfected by boiling or otherwise, and replaced at will. Its construction is simple. Slotted tapes of fabric are attached round the edges of the entrance into the pocket itself and near the edges of the garment entrance for the pocket. A narrow strip of fabric binds the corresponding edges together by simply lacing one to the other. Dr. Edgelow has worn such pockets for some months and finds them holeproof and otherwise satisfactory. "The dirty and infected condition of the ordinary fixed pockets of garments is," he remarks, "a reflection on the progress of hygiene." And practical hygienists will agree with him.

SURBITON HOSPITAL.—Cricket matches played annually for the benefit of the hospital for the last five years between an All-England team, and a team of 18 selected from the Surbiton cricket clubs, have produced over £3000. The money has been used for the purchase of Hill Manor, Surbiton Hill, for the provision of a larger hospital.

Births, Marriages, and Deaths

MARRIAGES

COSTOBADIE—WILKINSON.—On Sept. 23rd, at the Huguenot Chapel, Canterbury Cathedral, Lionel Palliser Costobadie, M.D., F.R.C.S., of Brookfield, Folkestone, to Aileen, only daughter of Mr. and Mrs. G. B. Wilkinson, of Smallhythe, Tenterden, and Folkestone.

MACKINNON—MACDONALD.—On Sept. 20th, at the Congregational Church, Wendover, Dr. Alistair MacKinnon to Dr. Joan M. MacDonald.

ORR—CARMICHAEL.—On Sept. 7th, at Windsor Presbyterian Church, Belfast, John Washington Orr, M.D., B.Sc. Belf., to Nora Margaret, second daughter of Mr. and Mrs. D. J. Carmichael, of 7, Harberton-drive, Balmoral, Belfast.

POPE—GALE.—On Sept. 24th, at Milland Church, Samuel Pope, M.D., to Charlotte Hope, youngest daughter of the late Ernest Sewell Gale, F.R.I.B.A., and Mrs. Gale, of Tile Cottage, Liphook, Hampshire.

ROSS—CUTHBERT.—On Sept. 20th, at Tron Church, Edinburgh, William Fraser Ross to Margaret Jane Mudie Cuthbert, M.A., M.B., Ch.B., Sheen-road, Richmond, Surrey.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.